The PHOTOFACT® Servicer

SET 538 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JULY 1961

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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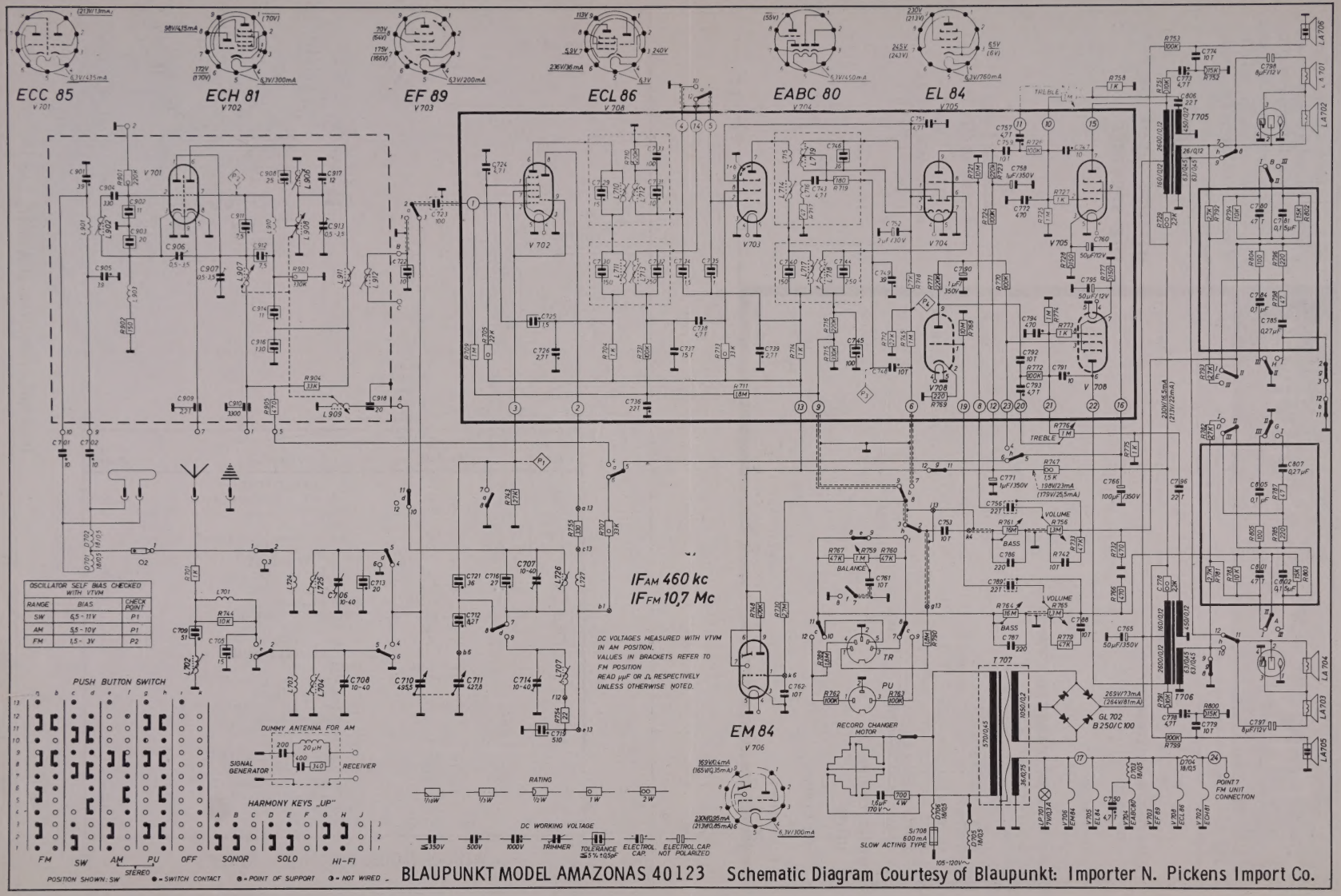
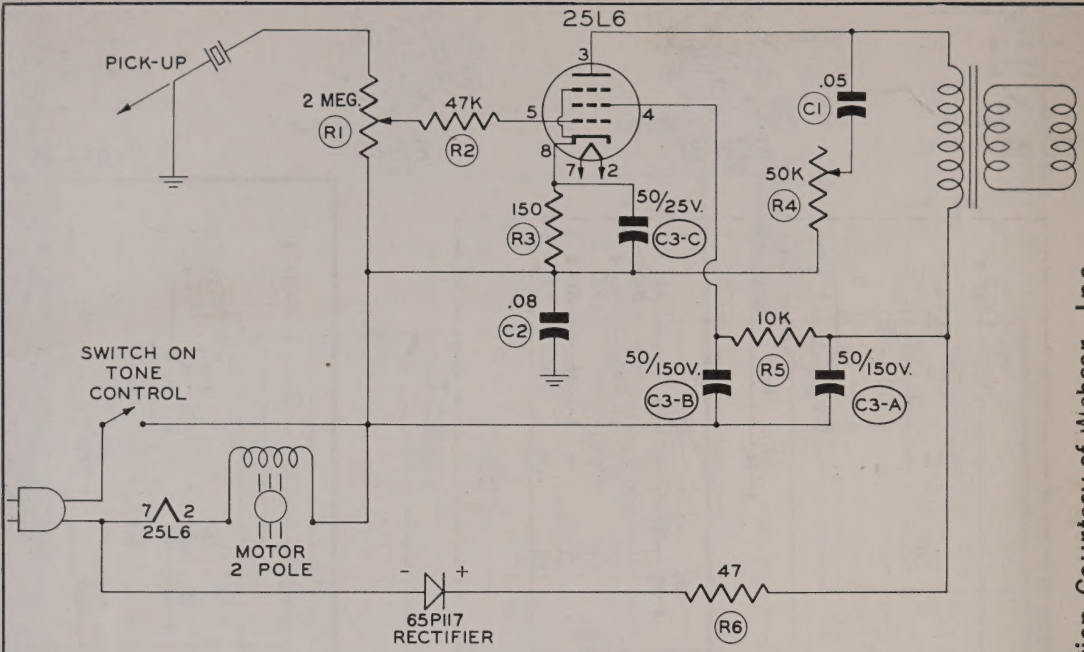
Blaupunkt Model Amazonas 40123

Webcor Model 1852 (CH. 14X258)



BLAUPUNKT MODEL AMAZONAS 40123 Schematic Diagram Courtesy of Blaupunkt: Importer N. Pickens Import Co.



Circuit Symbol	Webcor Part No.	Description	List Price
		CAPACITORS	
C1	30P255	.05mfd, 400 volts, paper tubular	$ .30
C2	30P304	.08mfd, 400 volts, paper tubular	.30
C3A	30P257	50mfd, 150 volts } 3 section electrolytic	2.00
C3B		50mfd, 150 volts	
C3C		50mfd, 25 volts	
		RESISTORS	
R1	31P114	2 megohm, VOLUME control	1.00
R2	29M4732	47,000 ohms, ½ watt	.20
R3	29M1512	150 ohms, ½ watt	.15
R4	31P107	50,000 ohms, **TONE** control	1.25
R5	29M1032	10,000 ohms, ½ watt	.15
R6	29M4702	47 ohms, ½ watt	.15
		MISCELLANEOUS	
S1	Part of R4	On-Off Switch	
SP1	76P063	Speaker, 5" PM, 3.2 ohms, with output transformer	6.00
	76P011	Speaker, 5" PM, 3.2 ohms, without output transformer	5.00
SR1	65P117	Selenium Rectifier	1.50
T1	67P057	Output Transformer	3.00
	26P746	Screw, #6-32 x 1/4" H.H.S.T.	.02
	26P276	Hexnut, Control Mounting	.10
	26P028	Hexnut, Rectifier Mounting	.10
	25P221	Lockwasher, Rectifier Mounting	.03
	38P020	Tube Socket, Octal	.25
	20P1910-63	A.C. Cord Set	1.50

Information Courtesy of Webcor, Inc.

WEBCOR MODEL 1852 (CH. 14X258)

PHOTOFACT® Folder

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

DELMONICO
MODEL PTV-19

DELMONICO
MODEL PTV-19

MODEL PTV-19

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

DELMONICO MODEL PTV-19

MODEL PTV-19

CAUTION

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Delmonico, Model PTV-19
IMPORTER	Delmonico International Division, Thompson-Starrett Co., Inc., 120-20 Roosevelt Ave., Corona, 68, New York
TYPE SET	Television Receiver
TUBES	VHF - Seventeen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 150 Watts, 1.5 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 26.75MC, Sound IF 22.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 3 screws (at bottom of front cover) and 1 on each side; tilt out from bottom and remove.

FUSE

A 2 Amp. fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Cabinet - Rear View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horiz. Freq. Slug (B1, top). (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Ratio Detector secondary (A12) located at bottom of chassis.

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

PINCUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible. Position the magnets so that all sides are straight.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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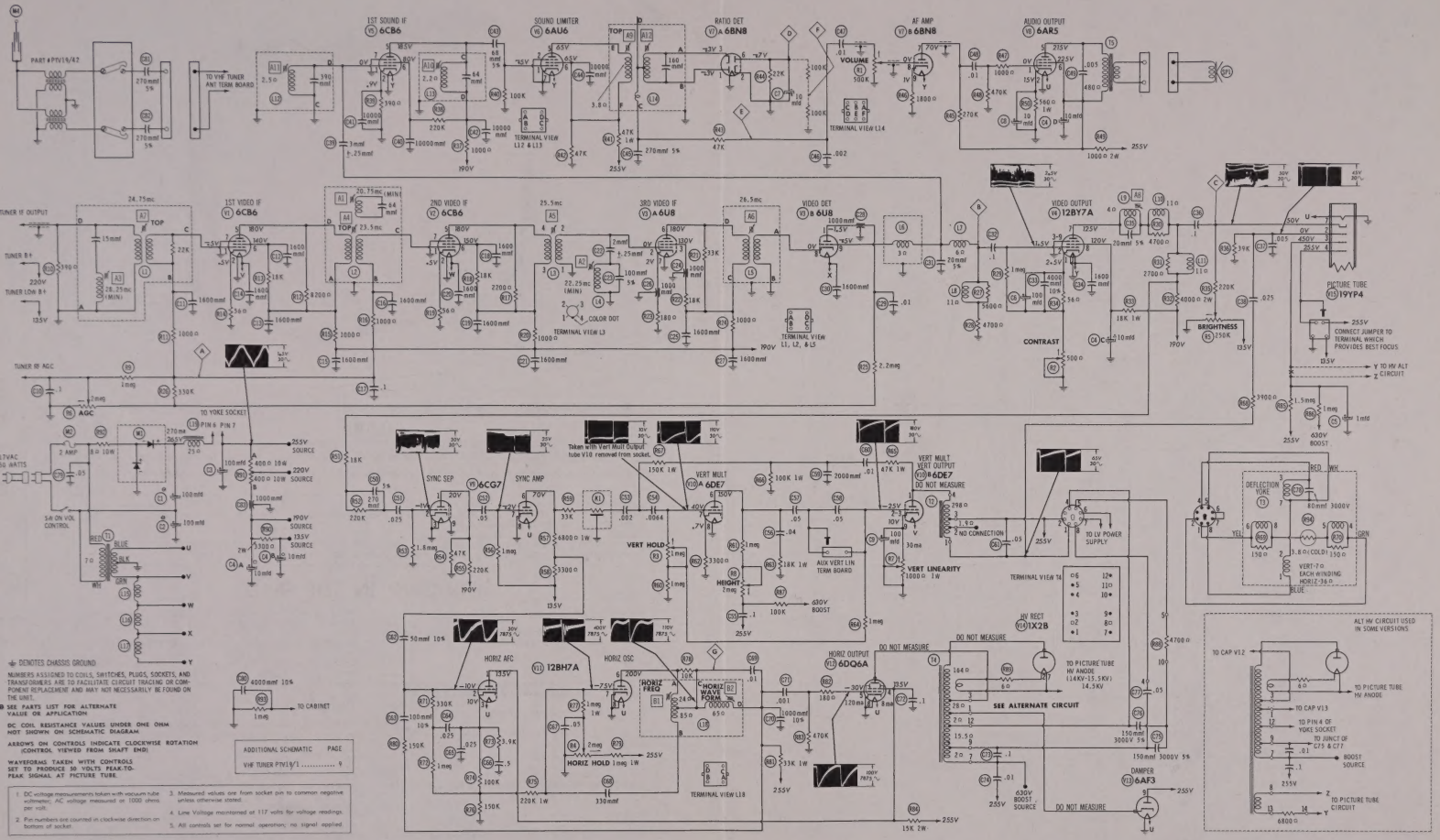
DELMONICO MODEL PTV-19

DELMONICO MODEL PTV-19

SET 538 FOLDER 1


1ST SOUND IF V5 6CB6
SOUND LIMITER V6 6AU6
RATIO DET V7A 6BN8
AF AMP V7B 6BN8
AUDIO OUTPUT V8 6AR5
VOLUME
TERMINAL VIEW L14
TERMINAL VIEW L12 & L13
TO VHF TUNER ANT TERM BOARD
PART # PTV19/42
TUNER IF OUTPUT
TUNER B+
TUNER LOW B+
TUNER RF AGC
1ST VIDEO IF V1 6CB6
2ND VIDEO IF V7 6CB6
3RD VIDEO IF V3A 6U8
VIDEO DET V3B 6U8
VIDEO OUTPUT W 12BY7A
TERMINAL VIEW L3
TERMINAL VIEW L1, L2, & L5
COLOR DOT
CONTRAST
BRIGHTNESS
PICTURE TUBE V15 19YP4
CONNECT JUMPER TO TERMINAL WHICH PROVIDES BEST FOCUS
Y TO HV ALT Z CIRCUIT
630V BOOST
AGC
TO YOKE SOCKET
117VAC 150 WATTS
3A ON VOL CONTROL
SYNC SEP V4 6CG7
SYNC AMP
VERT HOLD
VERT MULT V10A 6DE7
VERT MULT VERT OUTPUT V10B 6DE7
DO NOT MEASURE
AUX VERT LIN TERM BOARD
VERT LINEARITY
TERMINAL VIEW T4
TO LV POWER SUPPLY
DEFLECTION YOKE
HORIZ AFC V11 12BH7A
HORIZ OSC
HORIZ FREQ
HORIZ WAVE FORM
HORIZ HOLD
HORIZ OUTPUT V13 6DQ6A
SEE ALTERNATE CIRCUIT
TO PICTURE TUBE HV ANODE (14KV-15.5KV) 14.5KV
HV RECT V10 1X2B
DAMPER V13 6AF3
TERMINAL VIEW L18
TO CABINET
ALT HV CIRCUIT USED IN SOME VERSIONS
TO CAP V12
TO CAP V13
TO PIN 4 OF YOKE SOCKET
TO JUNCT OF C75 & C77
BOOST SOURCE
TO PICTURE TUBE HV ANODE
Z TO PICTURE TUBE CIRCUIT
DENOTES CHASSIS GROUND
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
ADDITIONAL SCHEMATIC PAGE
VHF TUNER PTV19/1 9
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured on 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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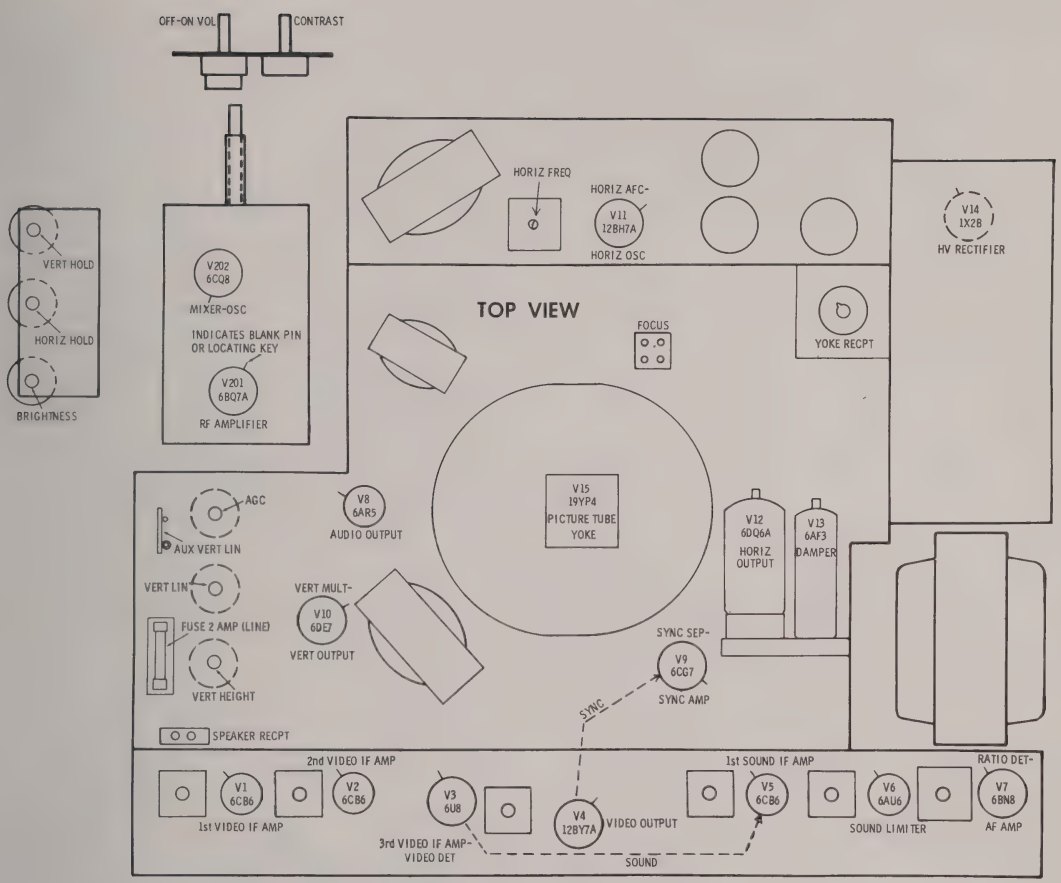
DELMONICO MODEL PTV-19

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (Line), Rectifiers (B+)

SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V15
No vertical deflection V10
Poor vert. linearity or foldover V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, Rectifiers (B+)
Vert. off freq. V10
Horiz. off freq. V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V5, V6, V7, V8

SYNC FAILURE
No vert. sync V9
No horiz. sync V9
No vert. or horiz. sync V9

DELMONICO
MODEL PTV-19

FOLDER 1

TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8721, 8722
WALSCO #2519

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Place a thin insulated metal strip between the Mixer-Osc. tube and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not Used	20.75MC	Any non-interfering channel	Use VTVM DC probe thru 10K to point (B). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	22.25MC	"	"	A2	"
3.	"	"	28.25MC	"	"	A3	"
4.	"	"	23.5MC	"	"	A4	Adjust for maximum deflection.
5.	"	"	25.5MC	"	"	A5	"
6.	"	"	26.5MC	"	"	A6	"
7.	"	24MC (10MC Swp.)	20.75MC 23.25MC 25.5MC 26.75MC	"	Vert. Amp. of scope thru 10K to point B. Low side to chassis.	Mixer Plate Coil & A7	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. If necessary, retouch A6 to place 26.75MC at 50% and A4 to place 23.25MC marker at 60% on curve.

4.5MC TRAP ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	High side thru .01mfd to point (B). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	RF probe to point (C). Common to chassis.	A8	Adjust for MINIMUM deflection on VTVM.

SOUND IF ALIGNMENT

Connect two matched 100K (±1%) resistors in series from point (D) to chassis. The junction of these two resistors is alignment point (F) as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	High side thru .01mfd to point (B). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe to point (D). Common to chassis.	A9, A10, A11	Adjust for maximum deflection.
10.	"	"	"	DC probe to point (E). Common to point (F).	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

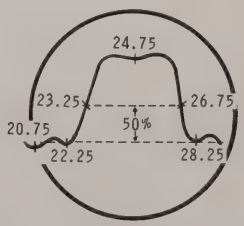
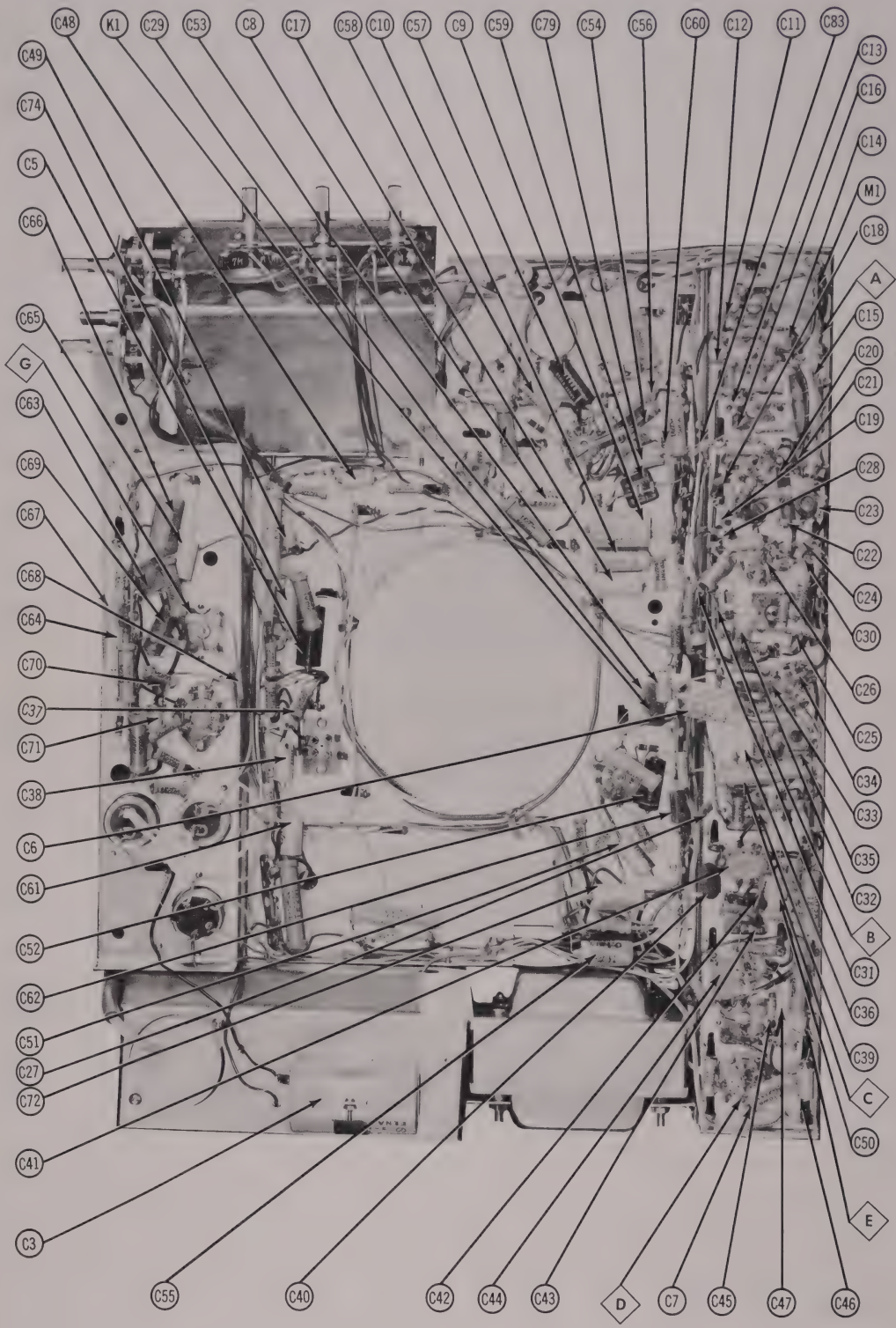
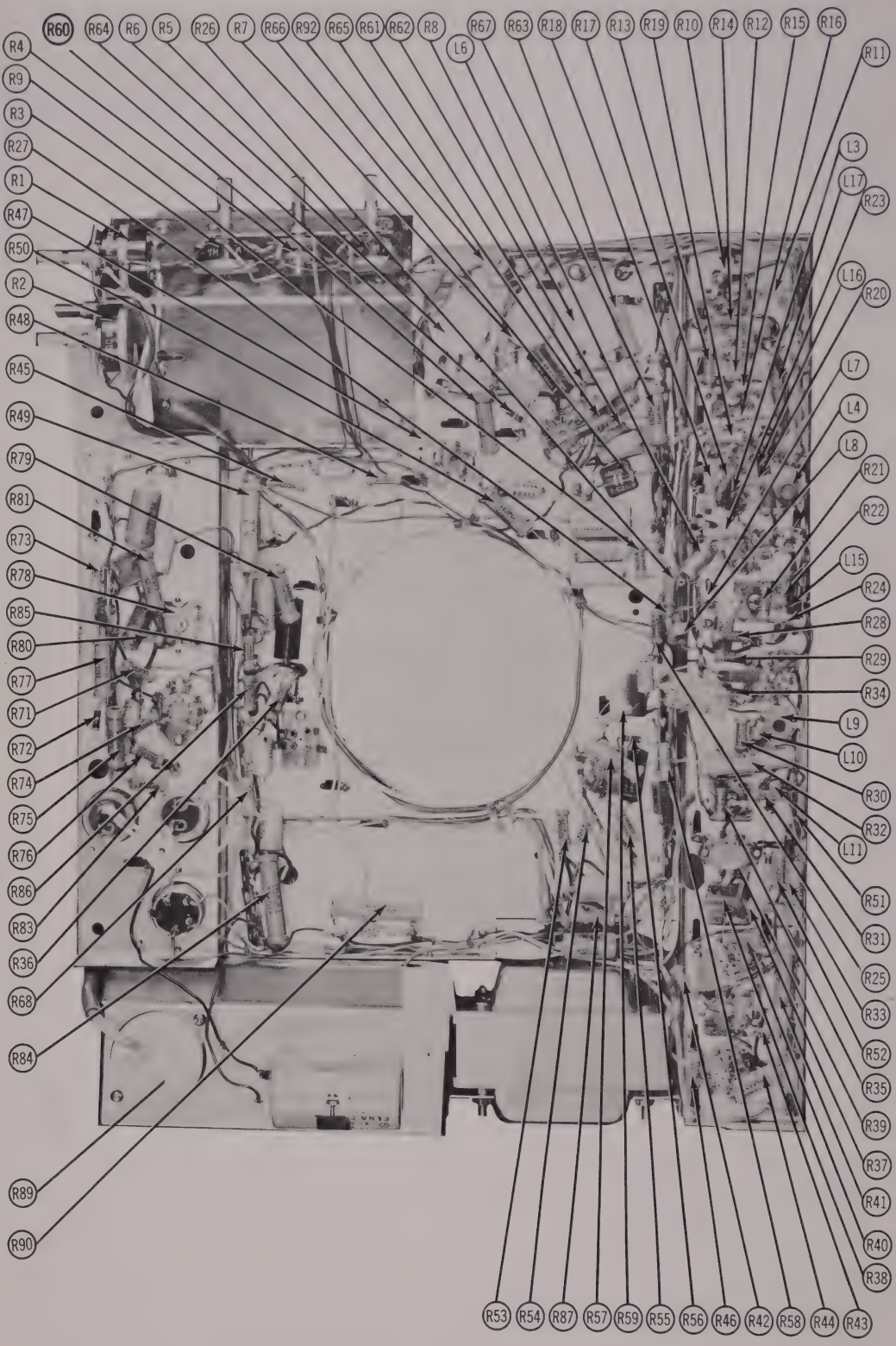


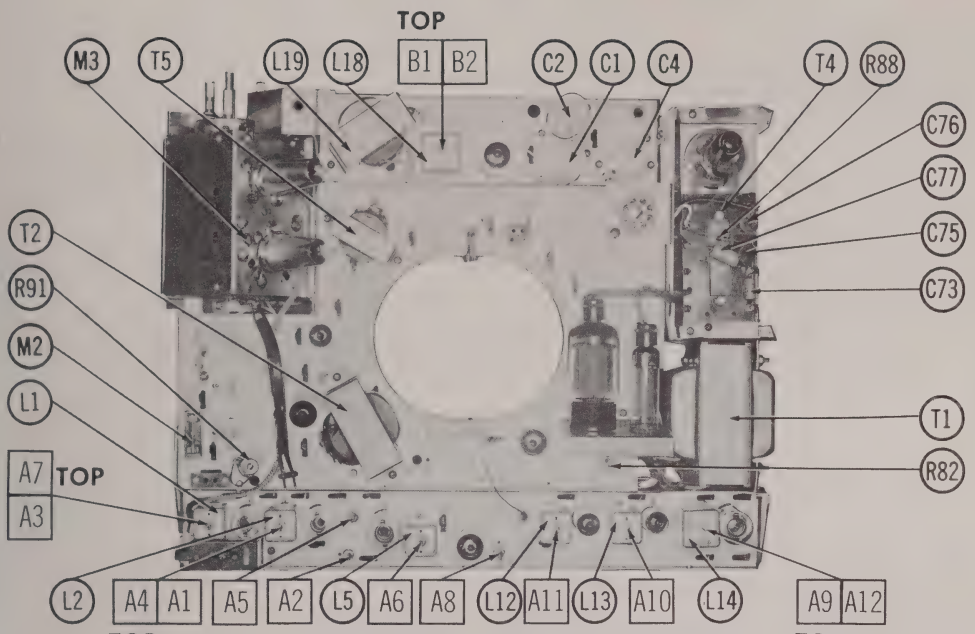
FIG. 1



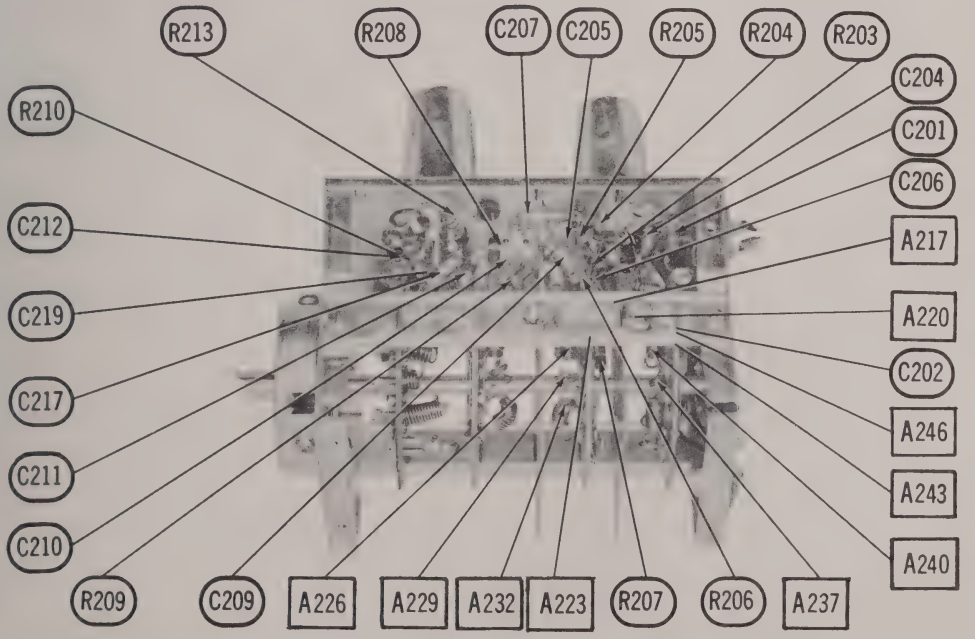
CHASSIS BOTTOM VIEW - ALIGN., CAPACITOR, MISC. IDENT.



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



CHASSIS - TOP VIEW



VHF TUNER PTV19/1 - RIGHT SIDE

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A212 ..... GENERAL CEMENT #8607, 9291, 9294
WALSCO #2520, 2522, 2523, 2524, 2534, 2537

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the Fine Tuning to the center of its range.
Connect the negative lead of a 3 volt bias supply to point Ⓣ. Positive to chassis.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

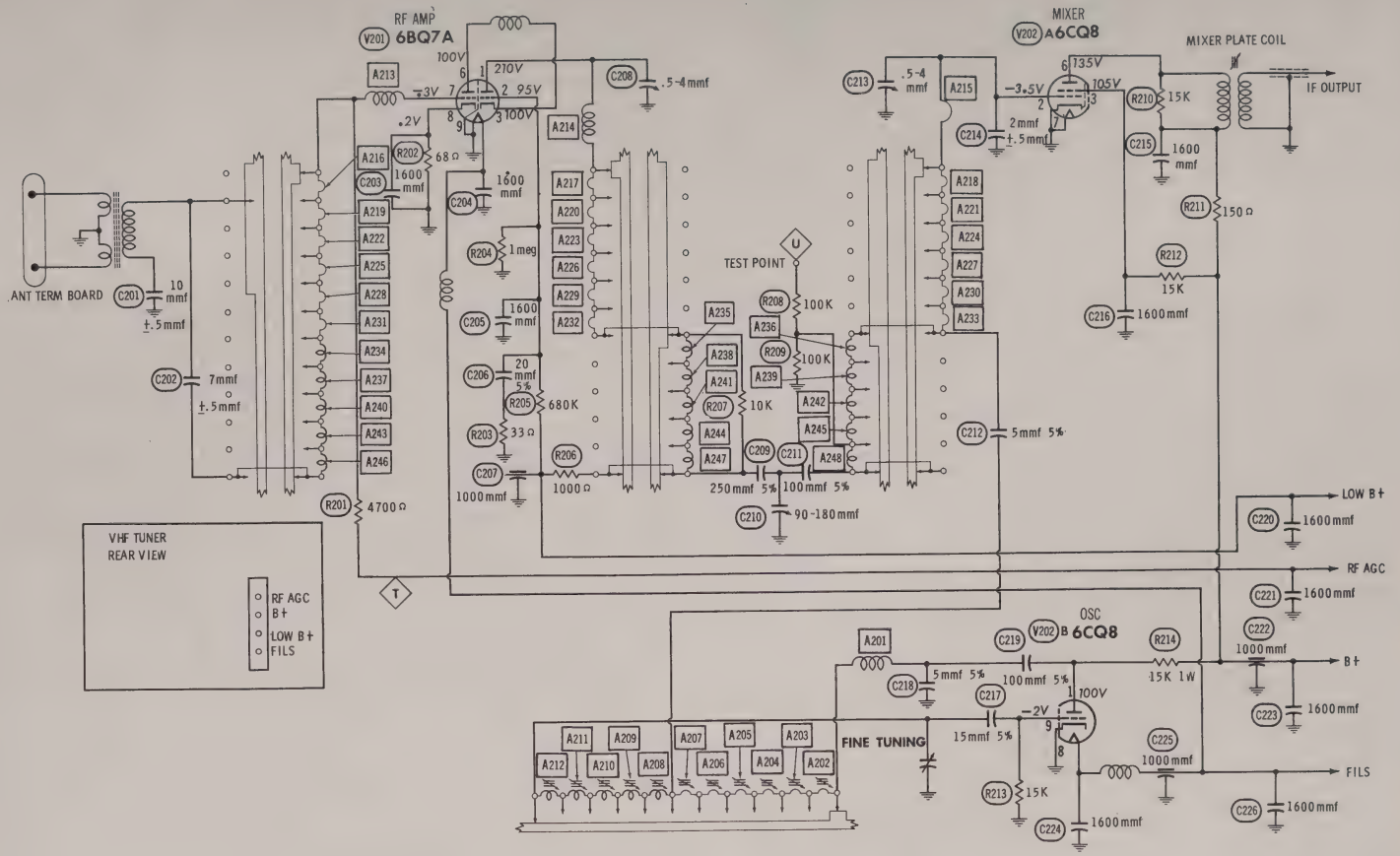
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across VHF Antenna terminals thru matching network (Fig. 201).	213MC	211.25MC	13	Vert. Amp. thru 10K across Video Detector load	A201	Adjust to place Video marker at 50% on response curve as shown in Fig. 202.
			207MC	205.25MC	12		A202	
			201MC	199.25MC	11		A203	
			195MC	193.25MC	10		A204	
			189MC	187.25MC	9		A205	
			183MC	181.25MC	8		A206	
			177MC	175.25MC	7		A207	
			85MC	83.25MC	6		A208	
			79MC	77.25MC	5		A209	
			69MC	67.25MC	4		A210	
			63MC	61.25MC	3		A211	
			57MC	55.25MC	2		A212	

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Connect the negative lead of a 3 volt bias supply to point Ⓣ. Positive to chassis.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Disconnect IF link from IF strip and terminate with a 68 ohm resistor at open end only. Tuner cover must be in place when observing response on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Fig. 201	Across VHF antenna terminals thru matching network (Fig. 201).	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A213 A214 A215	Adjust in numerical order for maximum gain and symmetry of response similar to Fig. 203. A213 controls marker position. A214 controls tilt, A215 controls gain.
3.	"	"	207MC	205.25MC 209.75MC	12	"	A216 A217 A218	Adjust in numerical order for response similar to Fig. 203. Adjust first coil for proper marker position, second coil for proper tilt and third coil for maximum gain.
4.	"	"	201MC	199.25MC 203.75MC	11	"	A219 A220 A221	"
5.	"	"	195MC	193.25MC 197.75MC	10	"	A222 A223 A224	"
6.	"	"	189MC	187.25MC 191.75MC	9	"	A225 A226 A227	"
7.	"	"	183MC	181.25MC 185.75MC	8	"	A228 A229 A230	"
8.	"	"	177MC	175.25MC 179.75MC	7	"	A231 A232 A233	"
9.	"	"	85MC	83.25MC 87.75MC	6	"	A234 A235 A236	"
10.	"	"	79MC	77.25MC 81.75MC	5	"	A237 A238 A239	"
11.	"	"	69MC	67.25MC 71.75MC	4	"	A240 A241 A242	"
12.	"	"	63MC	61.25MC 65.75MC	3	"	A243 A244 A245	"
13.	"	"	57MC	55.25MC 59.75MC	2	"	A246 A247 A248	"

WAVEFORMS - PAGE 13



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER PTV19/1

DELMONICO
MODEL PTV-19

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC • RAYTHEON • SYLVANIA • USE	TYPE
V1	1st Video IF Amp.	6CB6
V2	2nd Video IF Amp.	6CB6
V3	3rd Video IF Amp. - Sync Sep. - 1st Video Det.	6U8
V4	Video Output	12BY7A
V5	1st Sound IF Amp.	6CB6
V6	Sound Limiter	6AU6
V7	Ratio Det. - AF Amp.	6BN8
V8	Audio Output	6AR5
V9	Sync Sep. - Sync Amp.	6CG7
V10	Vert. Mult. - Vert. Output	6DE7
V11	Horiz. AFC - Horiz. Osc.	12BH7A
V12	Horiz. Output	6DQ6A
V13	Damper	6AF3
V14	HV Rectifier	1X2B

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: DELMONICO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V15	19VP4		19VP4 ①		19VP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: DELMONICO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	100	180		AFH1-31-25	XA3213	FP120.1	TMB-1550	TVL-1535	
C2	100	180		AFH1-31-25	XA3213	FP120.1	TMB-1550	TVL-1535	
C3	100	350		AFH1-55-30	A0813	FP150	TMB-1810	TVL-1750	
C4A	■40	300			CQ20	FP320.5	TMT-3438	TVL-3580	
B	■40	300			*BR1045	*C52	TD-10-450	*TVA-1604	
C	■10	500							
D	10	300							
C5	1	500		PRS800	BR450	GEM81			
C6	100	25		PRS270	BBR100-25	TC3501	TD-100-25	TVA-1207	
C7	10	50		PRS330	BBR10-50	TC33	TD-10-50	TVA-1304	
C8	10	50		PRS330	BBR10-50	TC33	TD-10-50	TVA-1304	
C9	100	25		PRS270	BBR100-25	TC3501	TD-100-25	TVA-1207	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C11	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C12	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C13	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C14	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C15	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C16	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C17	1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C18	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C19	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C20	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C21	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C22	2	± .25mmf		NPO-RI 2.0	TCZ-3R2	C0V7C	CCTO-3R2	CNO-532	10TCC-V22
C23	100	5%			TCZ-100	C0T1C	CCTO-101	CNO-310	10TCC-T10
C24	1000			EF-001	MFT-1000		CCF-102	CT280A	
C25	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C26	1000			EF-001	MFT-1000		CCF-102	CT280A	
C27	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C28	1000			EF-001	MFT-1000		CCF-102	CT280A	
C29	01	400V		P488N-01	DB-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C30	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C31	20	5%			TCZ-20	C0Q2C	CM-19B-200J	CNO-422	10TCC-Q20
C32	1	250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C33	4000	10%		1464-004		1R5D4	CM-20B-402M	MCB463	MS-34
C34	1600			BPD-0015	DD-162	L10D16	CCD-152	B-215	10TS-D16
C35	20	5%			TCZ-20	C0Q2C	CM-19B-200J	CNO-422	10TCC-Q20
C36	1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C37	.005	400V		P488N-005	DB-502	CUB4S5	4DP-3-503	GEM-425	4TM-S50
C38	.025	400V		P488N-025		DPM3S525	4DP-2-253	GEM-4125	4TM-S25
C39	3	± .25mmf		NPO-RI 3.0	TCZ-3R3	C0V3C	CCTO-3R3	CNO-533	10TCC-V33
C40	10000			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C41	10000			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C42	10000			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C43	68	5%			TCZ-68	C0Q68C	CM-19B-680J	CNO-468	10TCC-Q68
C44	10000			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	270	5%			TCZ-270	5RST2T	CM-19B-271J	CNO-327	10TCC-T27
C46	.002	400V		P488N-002	DB-202	CUB4D2	4DP-1-202	GEM-422	4TM-D20
C47	01	400V		P488N-01	DB-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C48	01	400V		P488N-01	DB-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C49	.005	400V		P488N-005	DB-502	CUB4S5	4DP-3-503	GEM-425	4TM-S50
C50	270	5%			TCZ-270	5RST2T	CM-19B-271J	CNO-327	10TCC-T27
C51	.025	400V		P488N-025		DPM3S525	4DP-2-253	GEM-4125	4TM-S25
C52	.05	400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C53	.002	400V		P488N-002	DB-202	CUB4D2	4DP-1-202	GEM-422	4TM-D20
C54	.0064	250V			DB-682	CUB4D6S	6DP-1-682	GEM-6268	6TM-D68
C55	1	600V		P488N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C56	.04	400V		P488N-04	DD-403	CUB5S4	4DP-3-403	GEM-414	4TM-S40
C57	.05	400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C58	.05	400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C59	2000			1464-003	DD-203	BYA10D2	CCD-203	B-220	5HK-D20
C60	01	400V		P488N-01	DB-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C61	.05	400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C62	50	10%		1469-0005	TCZ-50	2SR5Q5	CM-19B-500K	MCB225	MS-450
C63	100	10%		1469-0001	TCZ-100	2SR5T1	CM-19B-101J	MCB235	MS-31
C64	.025	400V		P488N-025		DPM3S525	4DP-2-253	GEM-4125	4TM-S25
C65	.025	400V		P488N-025		DPM3S525	4DP-2-253	GEM-4125	4TM-S25
C66	.5	100V		P288N-5		CUB3P5	3DP-5-504	GEM-205	2TM-P50
C67	.05	400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C68	330			1469-00033		5R5T33	CM-19B-331K	MCB241	MS-333
C69	01	250V		P488N-01	DB-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C70	1000	10%		1469-001		2SR5T1	CM-19B-102K	MCB235	MS-31
C71	.001	400V		P488N-001	DB-102		CUB6D1	6DP-1-102	GEM-621
C72	.1	400V		P488N-1	DF-104		CUB4P1	4DP-3-104	GEM-401

FIXED CAPACITORS (cont)

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C73	1	600V		P888N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C74	.01	400V		P488N-01	DB-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C75	150	3000V 5%							
C76	150	3000V 5%							
C77	.05	400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C78	80	3000V		HVD-30-82	D330-820		3CCD-820	3DY-482	30GA-Q82
C79	.05	400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C80	4000	10%		1464-004		1R5D4	CM-20B-402K	MCB463	MS-34
C81	270	5%			TCZ-270	5RST2T	CM-19B-271J	CNO-327	10TCC-T27
C82	270	5%			TCZ-270	5RST2T	CM-19B-271J	CNO-327	10TCC-T27
C83	1000			EF-001	MFT-1000		CCF-102	CT280A	

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: DELMONICO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500 K	½	PTV19/169	AB-50				Volume
B	Shaft			AK-29				
C	Switch			K2-3				Power Off-On
R2A	500Ω	½	PTV19/167	AB-415				Contrast
B	Shaft			AK-29				
R3A	1meg	½	PTV19/170	AB-69				Vert. Hold
B	Shaft			AK-29				
R4	2meg	½	PTV19/153					Horiz. Hold
R5A	250K	½	PTV19/168	AB-50				Brightness
B	Shaft			AK-29				
R6A	2meg	½	PTV19/171	AB-75				AGC
B	Shaft			AK-29				
R7A	1000Ω	1	PTV19/143	AB-5				Vert. Linearity
B	Shaft			AK-29				
R8A	2meg	½	PTV19/171	AB-75				Height
B	Shaft			AK-29				

RESISTORS

All wattages 1/2 watt, or less, unless otherwise noted.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R9	1meg			
R10	390Ω			
R11	1000Ω			
R12	8200Ω			
R13	18K			
R14	56Ω			
R15	1000Ω			
R16	1000Ω			
R17	2200Ω			
R18	18K			
R19	56Ω			
R20	1000Ω			
R21	33K			
R22	18K			
R23	180Ω			
R24	1000Ω			
R25	2.2meg			
R26	330K			
R27	5600Ω			
R28	4700Ω			
R29	1meg			
R30	4700Ω			
R31	2700Ω			
R32	4000Ω 2W			
R33	18K 1W			
R34	56Ω			
R35	220K			
R36	39K			
R37	1000Ω			
R38	220K			
R39	390Ω			
R40	100K			
R41	47K 1W			
R42	47K			
R43	47K			
R44	22K			
R45	270K			
R46	1800Ω			
R47	1000Ω			
R48	470K			
R49	1000Ω 2W			
R50	560Ω 1W			
R51	18K			
R52	220K			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R53	1.8meg			
R54	47K			
R55	220K			
R56	1meg			
R57	6800Ω 1W			
R58	3300Ω			
R59	33K			
R60	1meg			
R61	1meg			
R62	3300Ω			
R63	18K 1W			
R64	1meg			
R65	47K 1W			
R66	100K 1W			
R67	150K 1W			
R68	2900Ω			
R69	150Ω 1W			
R70	150Ω			
R71	330K			
R72	1meg			
R73	3900Ω			
R74	100K			
R75	220K 1W			
R76	150K			
R77	1meg			
R78	10K			
R79	1meg 1W			
R80	150K			
R81	33K 1W			
R82	1800Ω			
R83	470K			
R84	15K 2W			
R85	1.5meg			
R86	1meg			
R87	100K			
R88	4700Ω			
R89	8Ω			
R90	3300Ω 2W			
R91A	400Ω 10W			
B	400Ω 10W			
R92	8Ω 10W			
R93	1meg			
R94	2.8Ω (Cold)			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: DELMONICO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1A	1st Video IF	PTV19/116					
B	23.75MC Trap						
L2A	2nd Video IF	PTV19/33					
B	20.75MC Trap						
L3	3rd Video IF	PTV19/106	TV-116	6250	RTC-8568	T232A	
L4	22.25MC Trap		TV-112	6171	RTC-8608	T215	
L5	4th Video IF	PTV19/32	TV-140	6252	RTC-8570	T234	
L6	RF Choke (30uh)	PTV19/110	TV-122	6152	RTC-8584	T300	
L7	Peaking (80uh)	PTV19/111	TV-186	6172	RTC-8590	T303	
L8	Peaking (200uh)	PTV19/112	TV-197	6154	RTC-8586	T312	
L9	4.5MC Trap		TV-151	1469	RTC-8602	T249	
L10	Peaking (200uh)	PTV19/113	TV-197	6154	RTC-8586	T312	
L11	Peaking (200uh)	PTV19/113	TV-197	6154	RTC-8586	T312	
L12	1st Sound IF	PTV19/34	TV-154	1470-A	RTC-8604	T247	
L13	2nd Sound IF	PTV19/34	TV-154	1470-A	RTC-8604	T247	

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA: DELMONICO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L14	Ratio Detector	PTV19/39	TV-110	1468	RTC-8601	T240	
L15	Fil. Choke (1.3uh)		BC-562	4604	RTC-8516	T856	
L16	Fil. Choke (1.3uh)		BC-562	4604	RTC-8516	T856	
L17	Fil. Choke (1.3uh)		BC-562	4604	RTC-8516	T856	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: DELMONICO PART No.	Merit PART No.	Miller PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.
L18A	Horiz. Osc.	PTV19/38							
B	Horiz. Waveform								

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ~(1)	REPLACEMENT DATA: DELMONICO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L19	.270A	25Ω	1.1 Hy.	PTV19/43	C-2996 ①	C-2343 ①	26C44 ①	C-34X ①	① Drill new mounting hole(s).

TRANSFORMER (FIL)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: DELMONICO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V ② .5A	12.6VCT ③ 4.6A							

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: DELMONICO PART No.	Merit PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	Vert. Output	PTV19/35		PCM-2017 ①②	DY-26A ①	Y-47 ①	A-115X Y-60-1 ②③	
T3	Yoke (Horiz.15.6MC) (114°) (Vert. 13.4MC) Rear Cover and Centering Device	PTV19/25						
T4	Horiz. Output	PTV19/24						

① Remove horizontal damping network; use original.
② Connect Yoke Terminal #2 to Yoke Plug #6, Yoke Terminals #1 and #3 to Yoke Plug #5, Yoke Terminal #7 to Yoke Plug #8, Yoke #6 to Yoke Plug #1, Yoke Terminal #4 to Yoke Plug #2.
③ Remove 470Ω Resistor across vertical windings.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: DELMONICO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	8500Ω	3-4Ω	PTV19/86	A-3020	A-3823	26B48	S-18X	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: DELMONICO PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	PTV19/2	4A1	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	DELMONICO PART No.	REPLACEMENT DATA
X1	Vert. Integrator			

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: DELMONICO PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.270A	PTV19/165	1N1763 *	40E *	SR500 *	* Two required.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: DELMONICO PART No. FUSE	DELMONICO PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	2A 250V	PTV19/176	PTV19/120	312002 (3AG 2A 250V)	357001	AGC 2	4405

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	DELMONICO PART No.	NOTES
M3	Tuner	PTV19/1	VHF
M4	Antenna	PTV19/73	JFD Replacement #TA365

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	PTV19/16	
Knob	PTV19/23	Channel Selector
Knob	PTV19/41	Fine Tuning
Knob	PTV19/40	
Escutcheon	PTV19/17	Front

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

VHF TUNER PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6BQ7A	V202	Mixer - Osc.	6CQ8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	10 ±.5mmf		NPO-SI 10	TCZ-10	C10Q1C	CCTO-10	CNO-410	10TCC-Q10
C202	7 ±.5mmf		NPO-SI 6.8	TCZ-6R8	C10Q7C	CCTO-6R8	CNO-568	10TCC-V68
C203	1600		DI-1500	DD-162	L10D16	CCD-152	GP216	10TS-D16
C204	1600		DI-1500	DD-162	L10D16	CCD-152	GP216	10TS-D16
C205	1600		DI-1500	DD-162	L10D16	CCD-152	GP216	10TS-D16
C206	20 5%			TCZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C207	1000		EF-001	MFT-1000		CCF-102	CT280A	
C208	.5-4			829-4		CV-2	CT551	
C209	250 5%			TCZ-240	22R5T25	CM-19B-251J	MCE240	MS-325
C210	90-180							
C211	100 5%			TCZ-100	C10T1C	CCTO-101	CNO-310	10TCC-T10
C212	5 5%		NPO-SI 5.0	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C213	.5-4			829-4		CV-2	CT551	
C214	2 ±.5mmf		NPO-SI 2.0	TCZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C215	1600		DI-1500	DD-162	L10D16	CCD-152	GP216	10TS-D16
C216	1600		DI-1500	DD-162	L10D16	CCD-152	GP216	10TS-D16
C217	15 5%			TCZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C218	5 5%		NPO-SI 5.0	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C219	100 5%			TCZ-100	C10T1C	CCTO-101	CNO-310	10TCC-T10
C220	1600		DI-1500	DD-162	L10D16	CCD-152	GP216	10TS-D16
C221	1600		DI-1500	DD-162	L10D16	CCD-152	GP216	10TS-D16
C222	1000		EF-001	MFT-1000		CCF-102	CT280A	
C223	1600		DI-1500	DD-162	L10D16	CCD-152	GP216	10TS-D16
C224	1600		DI-1500	DD-162	L10D16	CCD-152	GP216	10TS-D16
C225	1000		EF-001	MFT-1000		CCD-102	CT280A	
C226	1600		DI-1500	DD-162	L10D16	CCD-152	GP216	10TS-D16

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	4700Ω				R208	100K			
R202	68Ω				R209	100K			
R203	33Ω				R210	15K			
R204	1meg				R211	150Ω			
R205	680K				R212	15K			
R206	1000Ω				R213	15K			
R207	10K				R214	15K 1W			

TUNER ALIGNMENT INSTRUCTIONS (cont)

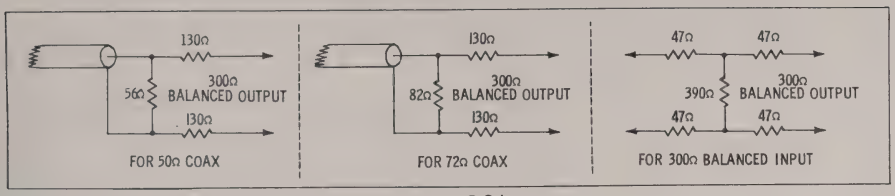


FIG. 201

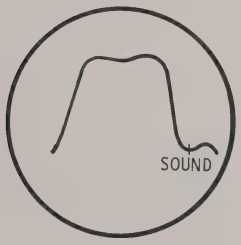


FIG. 202

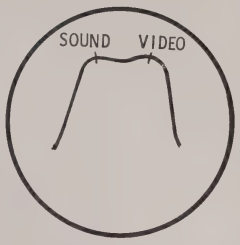
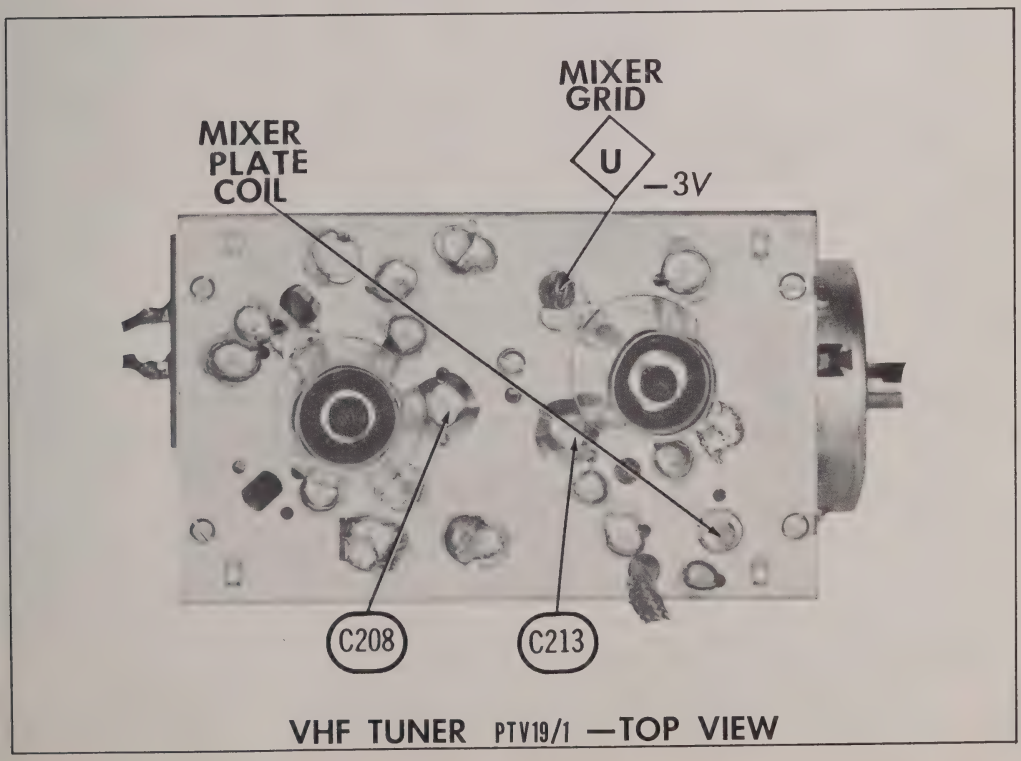
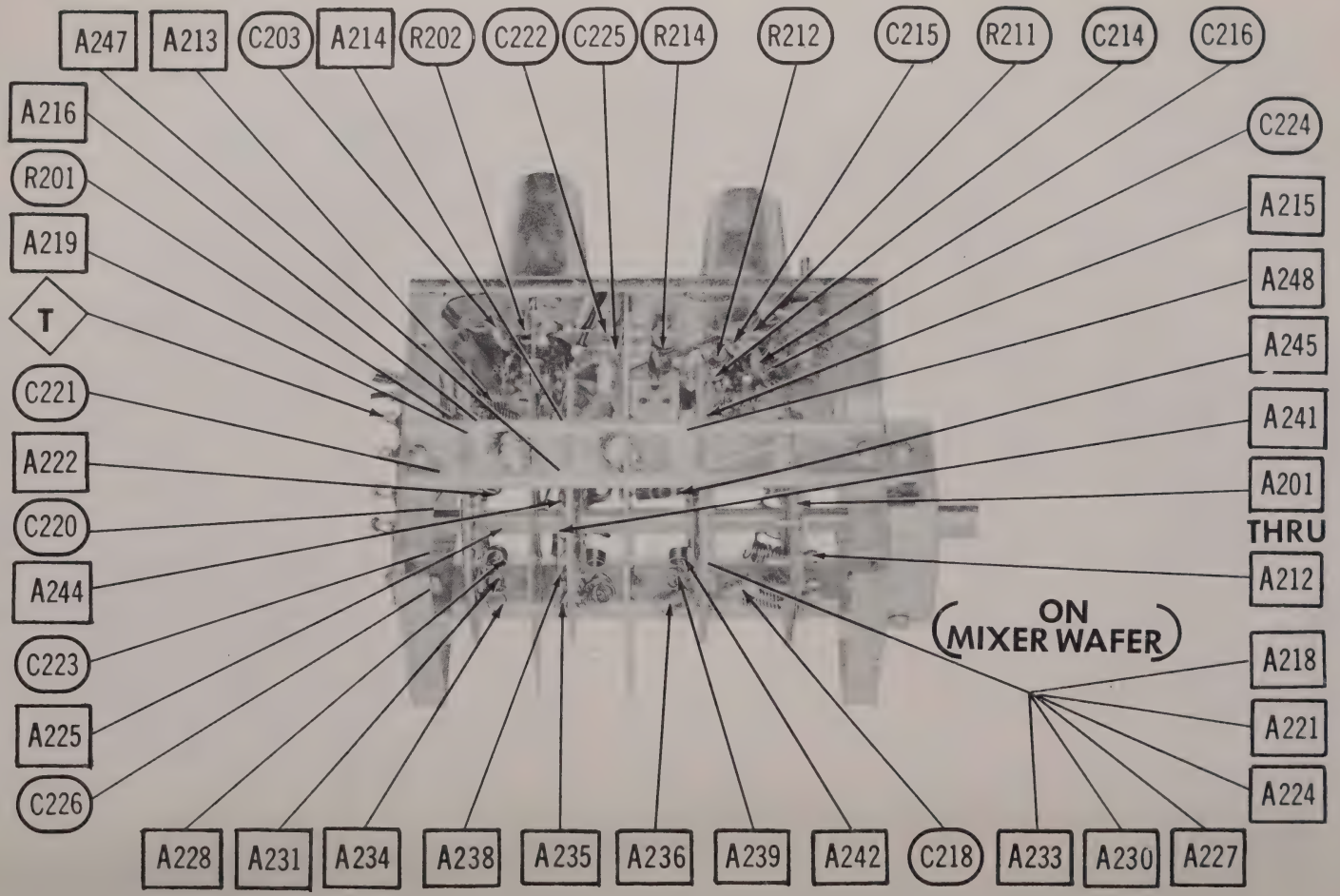


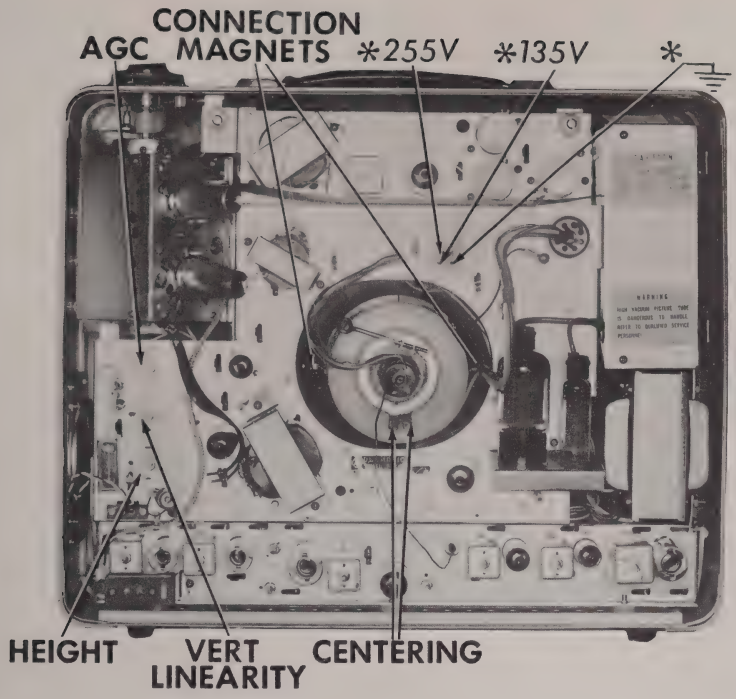
FIG. 203



VHF TUNER PTV19/1 —TOP VIEW



VHF TUNER PTV19/1 - LEFT SIDE



* FOCUS POINTS

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Preset Horizontal Frequency Slug (B1) so that screw projects from can 3/4". Preset Horizontal Waveform Slug (B2) so that screw projects 5/8". Adjust Horizontal Hold Control until picture synchronizes horizontally. Connect the vertical amplifier of the scope thru a low capacity probe to point G. Low side to chassis.

Adjust Horizontal Waveform Slug (B2) until the broad and sharp peaks are of equal amplitude as in Fig. 2. Keep the picture in sync during this adjustment with the Horizontal Hold.

Turn the Horizontal Hold fully clockwise. The picture should fall out of sync with bars slanting downward to the right. Adjust the Horizontal Freq. Slug (B1) until about five (5) diagonal bars are obtained. Set Horizontal Hold Control to the center of its range. The picture should be in sync.

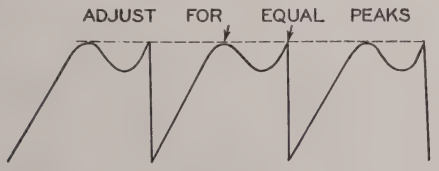


FIG. 2

DISASSEMBLY INSTRUCTIONS

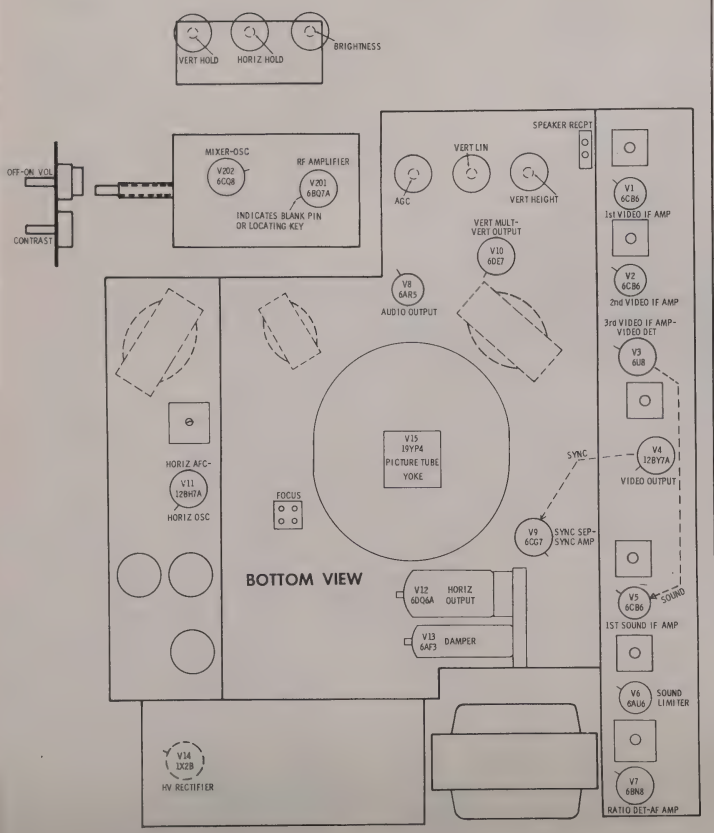
CHASSIS REMOVAL

1. Remove 8 metal screws holding rear cover. Pull rear cover back and disconnect antenna plug. Remove rear cover.
2. Remove 3 knobs on side and 4 knobs at top.
3. Disconnect picture tube socket, yoke plug, and speaker plug.
4. Remove 3 screws at bottom of chassis and 2 screws at top of chassis.
5. Remove ground wire to picture tube and disconnect lead at yoke plug.
6. Disconnect high voltage lead.
7. Remove chassis.

PICTURE TUBE REMOVAL

1. Remove 3 screws at bottom (and 1 on each side) of front cover (mask).
2. Remove front cover and safety glass.
3. Remove rear cover.
4. Disconnect picture tube socket and yoke plug.
5. Remove 4 nuts holding picture tube mounting brackets.
6. Pull picture tube out front far enough to disconnect high voltage lead.
7. Remove picture tube out front.

TUBE PLACEMENT CHART



RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	•1.2meg	56Ω	FIL	FIL	†1800Ω	†20K	0Ω		
V2	6CB6	•1.2meg	56Ω	FIL	FIL	†1800Ω	†20K	0Ω		
V3	6U8	•3.2meg	.1Ω	†20K	FIL	FIL	†1800Ω	180Ω	.1Ω	4700Ω
V4	12BY7A	•120Ω	1meg	0Ω	FIL	FIL	FIL	†4800Ω	†19K	0Ω
V5	6CB6	2.5Ω	390Ω	FIL	FIL	†1800Ω	†220K	0Ω		
V6	6AU6	100K	0Ω	FIL	FIL	†30K	†30K	0Ω		
V7	6BN8	INF	0Ω	INF	FIL	FIL	22K	†270K	•20K	1800Ω
V8	6AR5	470K	560Ω	FIL	FIL	†1500Ω	†1000Ω	NC		
V9	6CG7	†70K	1.8meg	0Ω	FIL	FIL	†14K	†1meg	0Ω	0Ω
V10	6DE7	†320Ω	2meg	2meg	FIL	FIL	•†2meg	•1.4meg	3300Ω	320Ω
V11	12BH7A	†15K	1.5meg	250K	FIL	FIL	†33K	300K	0Ω	
V12	6DQ6A	NC	FIL	NC	†15K	470K	TP	FIL	0Ω	TOP CAP †28Ω
V13	6AF3	NC	NC	NC	FIL	FIL	NC	NC	NC	†25Ω TOP CAP † 2.5meg
V14	1X2B	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †190Ω
V15	19YP4	FIL	39K	†1meg	†25K	NC	NC	•260K	FIL	
V201	6BQ7A	†1400Ω	†600K	INF	FIL	FIL	▪0Ω	•400K	68Ω	0Ω
V202	6CQ8	†19K	200K	†19K	FIL	FIL	†4300Ω	0Ω	0Ω	15K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1.
‡ MEASURED FROM CAP OF V13.
▪ MEASURED FROM PIN 3 OF V201.
NC NO CONNECTION
TP TIE POINT

PHOTOFACT® Folder with CIRCUITRACE®

PACKARD-BELL MODELS 23DC2, 23DD3 (Ch. 98D10)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

PACKARD-BELL MODELS
23DC2, 23DD3 (Ch. 98D10)

MODEL 23DD3 (CHASSIS 98D10)

PACKARD-BELL MODELS
23DC2, 23DD3 (Ch. 98D10)

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SET 538 FOLDER 2

PACKARD-BELL MODELS
23DC2, 23DD3 (Ch. 98D10)

MODEL 23DD3 (CHASSIS 98D10)

TRADE NAME	Packard-Bell Models 23DC2, 23DD3 (Ch. 98D10)
MANUFACTURER	Packard-Bell Electronics Corp., Service Div., 1920 So. Figueroa St., Los Angeles 7, Calif.
TYPE SET	Television Receiver
TUBES	VHF - Twenty
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 220 Watts, 2 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Press bottom center of safety glass back firmly. Insert a business card between safety glass and metal trim (left of center). Slide card to right to depress spring. Lift metal trim at bottom straight up. Remove safety glass.

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus Control. (For location, see "Tube Placement Chart".)

SYNC STABILITY

Sync stability may be varied by means of an ANI Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Width Coil. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive Control. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Ratio Detector secondary (A13) located at bottom of chassis.

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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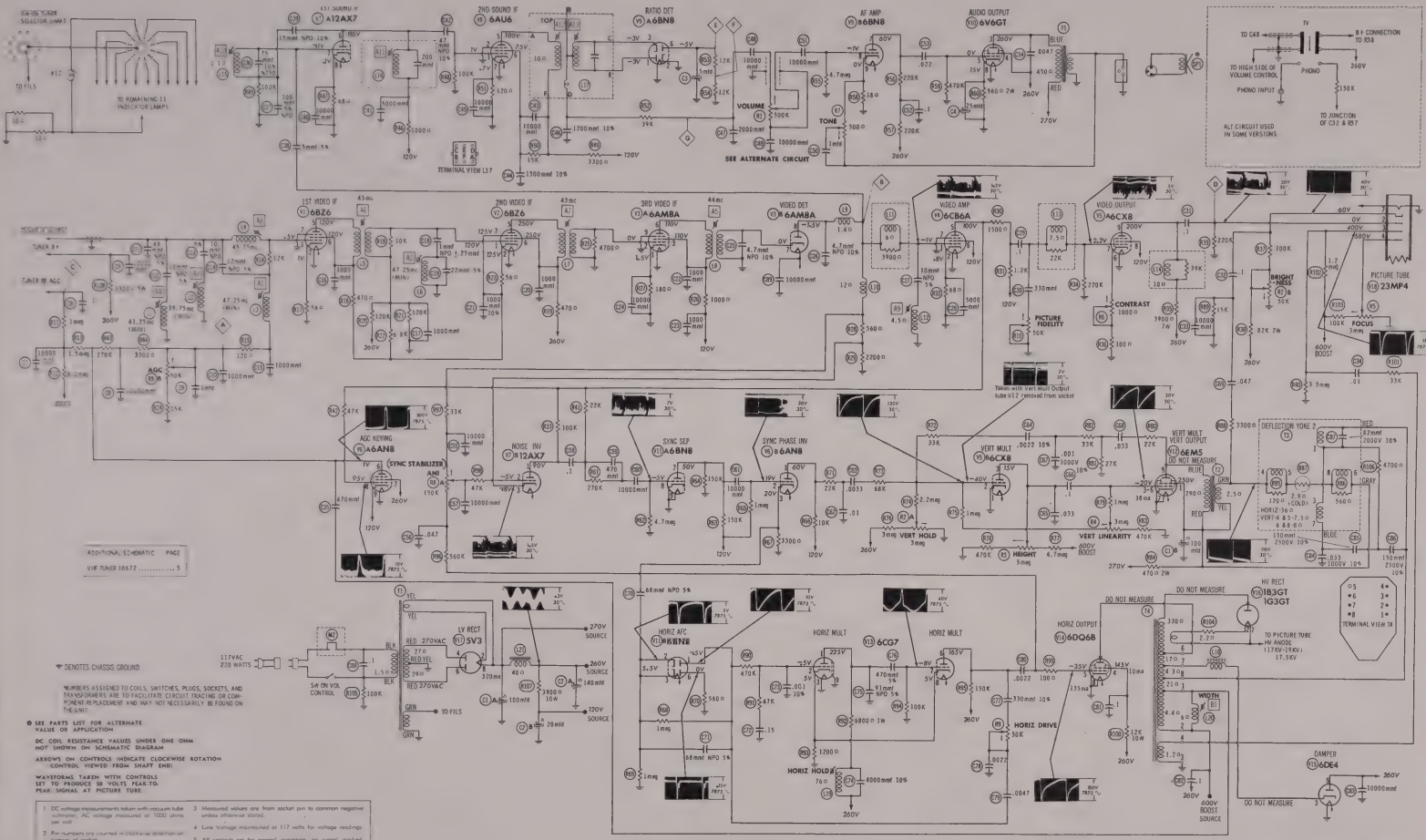
1ST VIDEO IF
A12AX7
2ND SOUND IF
6AU6
RATIO DET
6BN8
AF AMP
6BN8
AUDIO OUTPUT
6V6GT
1ST VIDEO IF
6BZ6
2ND VIDEO IF
6BZ6
3RD VIDEO IF
6AM8A
VIDEO DET
6AM8A
VIDEO AMP
6CB6A
VIDEO OUTPUT
6CX8
PICTURE TUBE
23MP4
AGC KEYING
6AN8
(SYNC STABILIZER)
NOISE INV
12AX7
SYNC SEP
6BN8
SYNC PHASE INV
6AN8
VERT MULT
6CX8
VERT MULT VERT OUTPUT
6EM5
HORIZ AFC
6BN8
HORIZ MULT
6CG7
HORIZ MULT
HORIZ OUTPUT
6DQ6B
HV RECT
1B3GT
1G3GT
DAMPER
6DE4
LV RECT
5V3
VOLUME
TONE
CONTRAST
BRIGHTNESS
FOCUS
PICTURE FIDELITY
VERT HOLD
VERT LINEARITY
HEIGHT
HORIZ DRIVE
HORIZ HOLD
WIDTH
600V BOOST
TO FILS
TO REMAINING 11 INDICATOR LAMPS
TERMINAL VIEW L17
SEE ALTERNATE CIRCUIT
TO HIGH SIDE OF VOLUME CONTROL
PHONO INPUT
TO JUNCTION OF C32 & R57
B+ CONNECTION TO R58
ALT CIRCUIT USED IN SOME VERSIONS
DO NOT MEASURE
TO PICTURE TUBE HV ANODE 117KV-19KV-17.5KV
TERMINAL VIEW T4
ADDITIONAL SCHEMATIC PAGE
VHF TUNER 10672 5
DENOTES CHASSIS GROUND
117VAC 220 WATTS
270V SOURCE
260V SOURCE
140 ma
120V SOURCE
320ma
150ma
20ma
SW ON VOL CONTROL
TO FILS
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END.
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt.
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated.
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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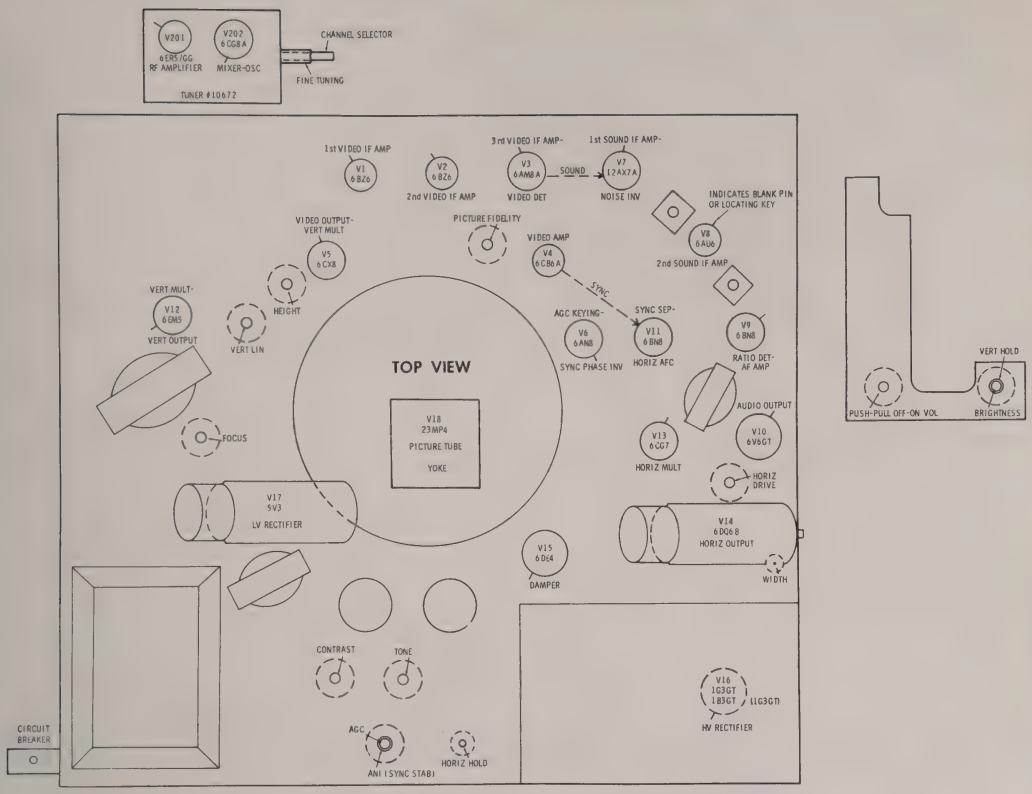
PACKARD-BELL MODELS 23DC2, 23DD3 (Ch. 98D10)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

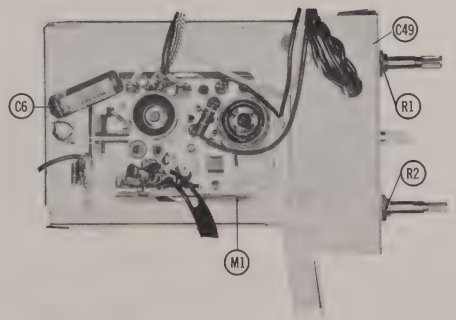
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker, V17

SWEEP FAILURE
No raster, has sound V13, V14, V15, V16, V18
No vertical deflection V5, V12
Poor vert. linearity or foldover V5, V12
Poor horiz. linearity or foldover V13, V14, V15
Narrow picture V13, V14, V15, V17
Vert. off freq. V5, V12
Horiz. off freq. V11, V13

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V5, V18
Has pic, no sound V7, V8, V9, V10
Overloaded picture V6

SYNC FAILURE
No vert. sync V11, V6
No horiz. sync V11, V6
No vert. or horiz. sync V11, V6



VHF TUNER-CONTROL BRACKET

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:
A1 thru A8, A10 .... GENERAL CEMENT #8721, 8722
WALSCO #2519
A9 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A12, A13 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
Mixer Plate Coil ... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Remove the Noise Inverter tube (12AX7, V7).
Connect the negative lead of a 6 volt bias supply to point Ⓐ. Positive to chassis.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	47.25MC (Unmod.)	Any non-interfering channel	DC probe thru 10K to point Ⓑ. Common to chassis. (Across Video Det. Load).	A1, A2	Set the generator output at maximum. Adjust for MINIMUM deflection.
2.	"	39.75MC	"	"	A3	"
3.	"	41.25MC	"	"	A4	"
4.	"	44MC	"	"	A5	Use only enough generator output to provide a usable indication on VTVM. Adjust for maximum deflection.
5.	"	45.0MC	"	"	A6	"
6.	"	43.0MC	"	"	A7	"
7.	"	45.75MC	"	"	A8	"
8.	"	45.0MC	"	"	Mixer Plate Coil	"

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect high side of a separate signal generator to ground lead of IF input cable to provide markers. DO NOT connect low side of generator.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Across antenna terminals with 120Ω in each lead.	63MC (10MC Swp.)	41.25MC 43.0MC 45.0MC 45.75MC 47.25MC	3	Vert. Amp. thru 22K to point Ⓑ. Low side to chassis. DC probe of VTVM to point Ⓒ. Common to chassis.		Adjust sweep output to develop -4 volts or less on AGC line as indicated by VTVM. Check for response curve similar to Fig. 1 with markers as shown. If necessary, retouch Mixer Plate Coil to position 45.75MC marker at 50%, A7 to position 43.0MC marker at corner of curve and A8 and A5 for correct tilt, dip or hump. A8 will affect higher frequency part and A5 the lower frequency. Replace V7.

4.5MC TRAP ALIGNMENT

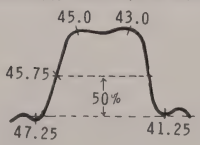
Remove Video Detector tube from its socket.

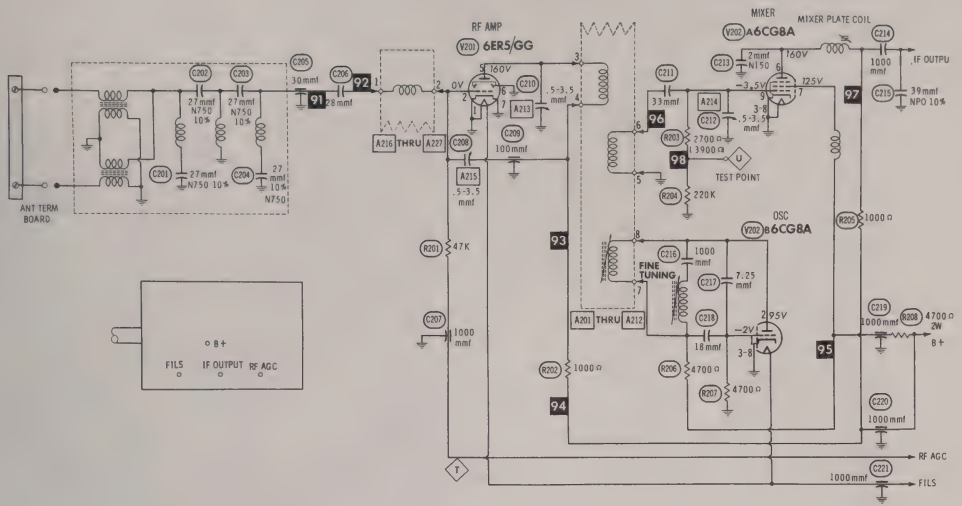
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	High side thru .01mfd to point Ⓑ. Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	RF probe to point Ⓓ. Common to chassis.	A9	Adjust for MINIMUM deflection. Replace Video Det. tube in its socket.

SOUND IF ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	High side thru .01mfd to point Ⓑ. Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe to point Ⓔ. Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
12.	"	"	"	DC probe to point Ⓔ. Common to point Ⓖ.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FIG. 1





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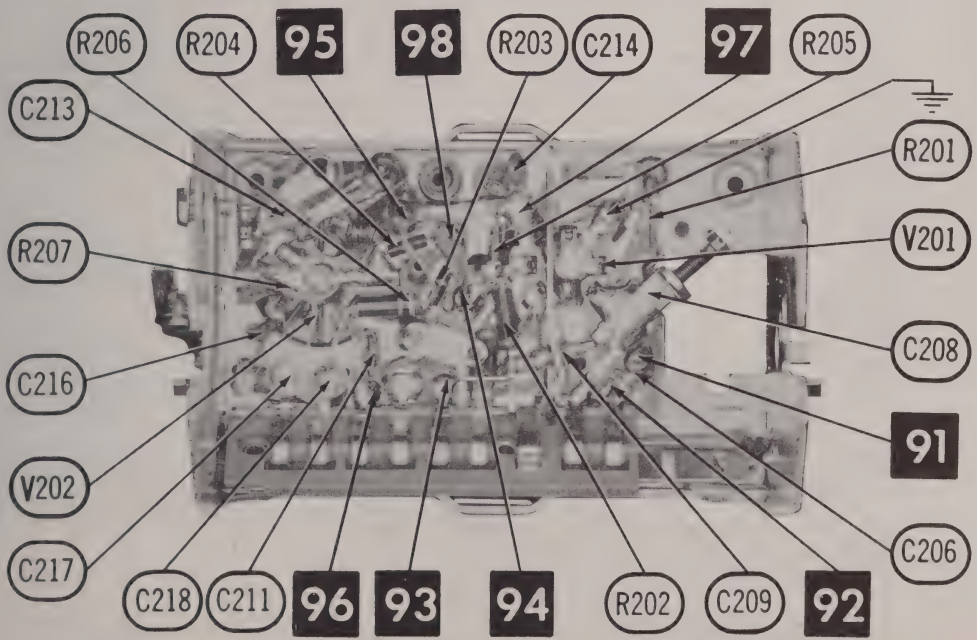
VHF TUNER 10672



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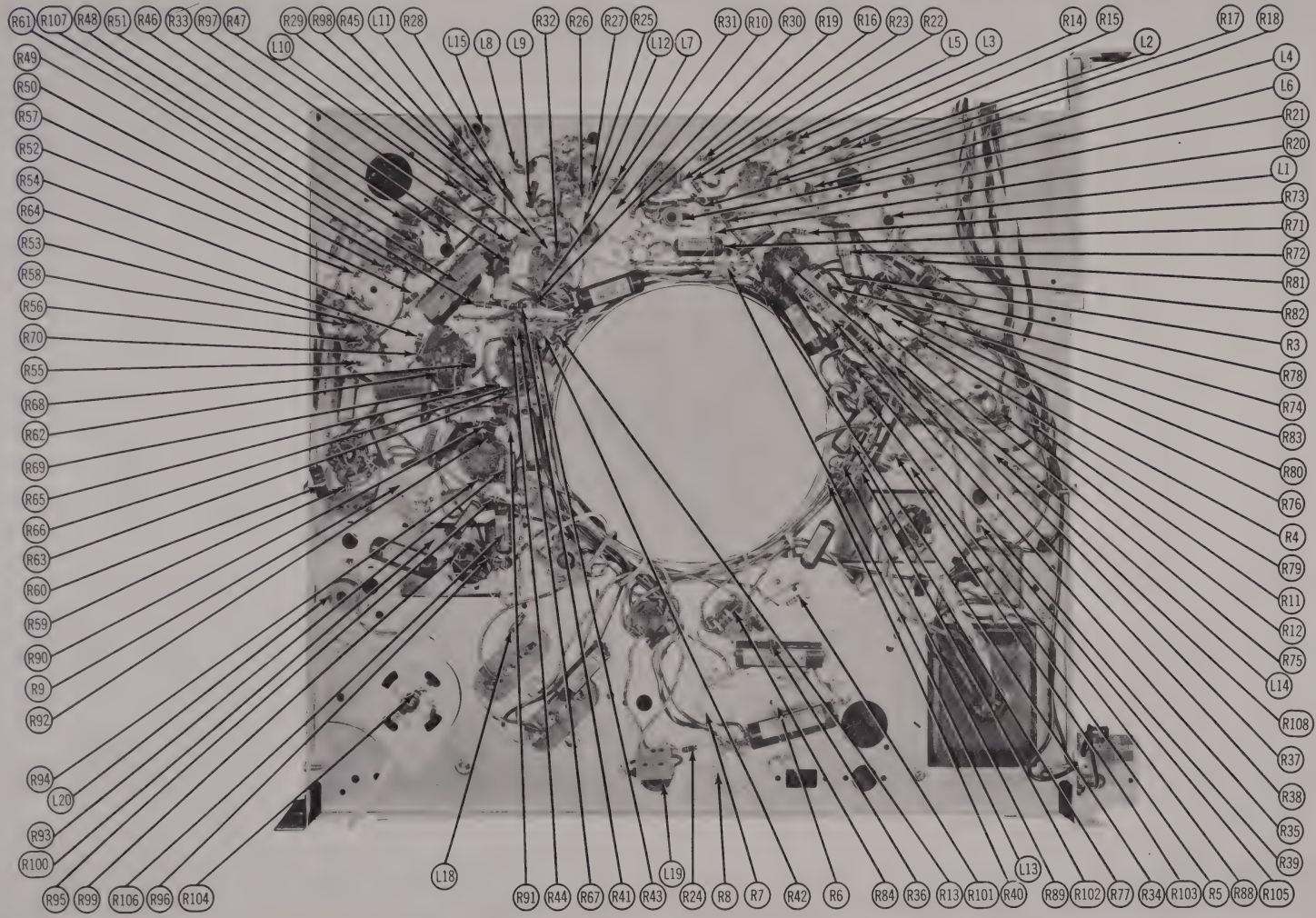
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER 10672 - BOTTOM VIEW



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

VHF TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A212 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A213 thru A215 ..... GENERAL CEMENT #9087, 9089
WALSCO #2528

VHF OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Detector load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

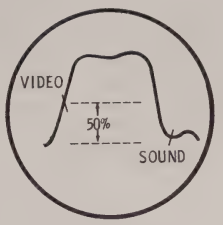


FIG. 201

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point (T). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (1). Low side to chassis.	A213, A214, A215	Adjust A213 and A214 for maximum amplitude and symmetry with markers as shown in Fig. 202. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A215 to obtain MINIMUM response on the scope.
3.	"	"	213MC	211.25MC 215.75MC	13	"	A216	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

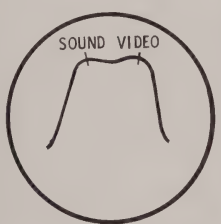


FIG. 202

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC • USE	TYPE	ITEM No.	RAYTHEON • USE	TYPE
V1	1st Video IF Amp.	6BZ6	V8	2nd Sound IF Amp.	6AU6
V2	2nd Video IF Amp.	6BZ6	V9	Ratio Det. - AF Amp.	6BN6
V3	3rd Video IF Amp. - Video Detector	6AM8A	V10	Audio Output	6V6GT
V4	Video Amp.	6CB6A	V11	Sync Sep. - Horiz. AFC	6BN6
V5	Video Output - Vert. Mult.	6CX8	V12	Vert. Mult. - Vert. Output	6EM5
V6	AGC Keying - Sync Phase Inv.	6AN8	V13	Horiz. Mult.	6CG7
V7	1st Sound IF Amp. - Noise Inverter	12AX7A	V14	Horiz. Output	6DQ6B
			V15	Damper	6DE4
			V16	HV Rectifier	1G3GT/3B3GT (1G3GT) *
			V17	LV Rectifier	5V3

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: Packard-Bell PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V18	23MP4		23MP4 ①		23MP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT.	REPLACEMENT DATA: Packard-Bell PART No.	AEROVOX PART No.	RCA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	400	350	34186	AFH32-41-50	A3512	-FP150	-TMS-1810	TVL-1750		
B	400	350			BR10035	TC69	TD-100-450	TVA-1718		
C2A	440	350	34158	AFH32-41-80		FP128.3	TMD-3440	TVL8-2642 *		
B	20	350								
C3	3	50	34038	PRS310	BBR5-50	TC30	TD-5-50	TVA-1303		
C4	25	25	34006	PRS1260	BBR25-25	TC26	TD-25-25	TVA-1305		

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C6	.1	200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C7	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C8	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C9	1mfd	100V		P288N-1.0		CUB2W1	1DP-5-105	GEM-2I	2TM-M1
C10	1000			BPD-001	DD-103	BYA10DI	CCD-102	B-210	5HK-D10
C11	68	NPO	5%		DTZ-5S	C10Q6SC	CCTO-680	CNO-468	10TCC-Q68
C12	10	NPO	5%	NPO-DI 10	DTZ-1O	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C13	10	NPO	5%	NPO-DI 10	DTZ-1O	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C14	12	NPO	5%	NPO-DI 12	TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C15	1000			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C16	1000			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C17	1000			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C18	1	NPO	±.25mmf	NPO-DI 1.0	TCZ-1				10TCC-V10
C19	.33		5%	1469-00032	TCZ-33	22R5Q32	CM-19B-220J	CNO-422	MS-422
C20	1000			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C21	1000			BPD-001	DD-103	BYA10DI	CCD-102	B-210	5HK-D10
C22	1000		10%	DI-1000	DD-103	PM5DI	CCD-102	B-210	10TS-D10
C23	1000			BPD-001	DD-103	BYA10DI	CCD-102	B-210	5HK-D10
C24	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C25	4.7	NPO	10%	NPO-DI 4.7	DTZ-4R7	C10Y47C	CCTO-4R7	CNO-547	10TCC-Y47
C26	4.7	NPO	10%	NPO-DI 4.7	DTZ-4R7	C10Y47C	CCTO-4R7	CNO-547	10TCC-Y47
C27	10	NPO	5%	NPO-DI 10	DTZ-1O	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C28	5000			BPD-005	DD-502	BYA10DS	CCD-502	B-250	5HK-D50
C29	.1	600V		P288N-1	DF-104	CUB2P1	6DP-4-104	GEM-601	6TM-P10
C30	330			DI-330	DD-331	L10T33	CCD-331	B-333	10TS-T33
C31	.1	600V		P288N-1	DF-104	CUB2P1	6DP-4-104	GEM-601	6TM-P10
C32	.1	400V		P288N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C33	10000			BPD-001	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C34	.01	600V		P668N-01	DE-103	CUB6SI	6DP-3-103	GEM-611	6TM-S10
C35	470			DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C36	75	N750	10%	N750-DI 75	DTN-7S	C10Q7SU	CCTN-750	CNT-475	10TCU-Q75
C37	100				TCZ-100	C10T1C	CCTO-101	CNO-310	10TCC-T10
C38	5		5%	NPO-SI 5.0	TCZ-4R7	C10Y5C	CCTO-050	CNO-547	10TCC-Y50
C39	15	NPO	10%	NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C40	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C41	5000			BPD-005	DD-502	BYA10DS	CCD-502	B-250	5HK-D50
C42	47	NPO	10%	NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C43	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C44	1500		10%	DI-1500	DD-152	PM5DI5	CCD-152	GP2I5	10TS-D15
C45	1000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C46	1200		10%	DI-1200	DD-122	5R5DI2	CCD-122	GP2I2	10TS-D12
C47	2000			BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C48	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C49	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C50	1mfd	100V		P288N-1.0		CUB2W1	2DP-5-105	GEM-2I	2TM-M1
C51	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C52	.1	600V		P668N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C53	.022	400V		P488N-022	DD-223	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C54	.0047	600V		P668N-0047	DD-503	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C55	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C56	.047	200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C57	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C58	.1	200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C59	470			DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C60	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C61	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C62	.01	600V		P668N-01	DE-103	CUB6SI	6DP-2-103	GEM-611	6TM-S10
C63	.0033	600V		P488N-0033	DS-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C64	.0022	400V	10%	V84C4D22-10%		PM5D22	6DP-1-222	GEM-1612	6TM-D22
C65	.033	600V		P668N-033	DD-303	CUB6S22	6DP-3-333	GEM-6233	6TM-S33
C66	.1	600V		P668N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C67	.001	1000V	10%	P104C1M-001I		DPM5E01	1SDP-3-1J3	GEM-1631	1UTM-D10
C68	.033	600V		P668N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6TM-S33

FIXED CAPACITORS (cont)

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C69	.047	600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C70	56	NPO	5%		DTZ-5S	C10Q56C	CCTO-560	CNO-468	10TCC-Q68
C71	68	NPO	5%		DTZ-6S	C10Q68C	CCTO-680	CNO-468	10TCC-Q68
C72	.15	200V		P288N-15		CUB3P15	3DP-3-154	GEM-3015	2TM-P15
C73	.001	600V	10%	194C6DI-10%		194C6DI	1SDP-2-102	GEM-1631	6TM-D10
C74	4000		10%	1464-004		IR5D4	CM-20B-403K	MCM463	MS-34
C75	91	NPO	5%		TCZ-91	C10Q9IC	CM-19B-910J		
C76	470		5%	1469-00047		5S5T47	CM-19B-471J	MCJ344	MS-347
C77	330		10%	1469-00033		5R5T33	CM-19B-331J	MCB241	MS-333
C78	.0022	600V		P668N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C79	.0047	600V		P668N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C80	.0022	600V		P668N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C81	.1	600V		P668N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C82	.1	600V		P668N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C83	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C84	.033	1000V	10%	P1064CM-033		DPM5E833	1SDP-3-333	GEM-1613	10TM-S33
C85	150	2500V	10%				VCM-20-151K		30TCY-T15
C86	150	2500V	10%				VCM-20-151K		30TCY-T15
C87	83	2000V	10%			HVB2Q82	VCM-20-830K	2DY-482	
C88	.1	200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C89	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	25801	B2L-80	C4TS-500K-2	B13-133 *	PP55A	Volume
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
C	Switch			Not Req.	Not Req.	SKT *	Not Req.	Push-Pull, Off-On
R2A	3meg	½	25802	F1-75			UE4223	Vert. Hold
B	50K	½		R2-39				Brightness
R3	5meg	½	25910	B4T-5meg-S	4LC-5		PTA56L	Height
R4	3meg	½	25867	B3K-84	B4T-5meg-S	4LC-3	SU-59	Vert. Linearity
R5	5meg	½	25867	B3K-84	B4T-5meg-S	4LC-5	SU-59	Focus
R6A	1000Ω	½	25904A	B-505	A4T-1000-S	CJ7-108	US	Contrast
B	Shaft			Not Req.	FKS-1/2	Not Req.	Not Req.	
R7	500Ω	½	25527			QU-103		Tone
R8A	150K	½	25968	F1-32			UE3912	ANI (Sync Stabilizer)
B	50K	½		R2-29		QU-981		AGC
R9A	50K	½	25908	B2K-51	B4T-50K-S	B11-123	PTA54L	Horiz. Drive
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R10A	50K	½	25946	B-32	A4T-50K-2	Q13-123	U33	Picture Fidelity
B	Shaft			Not Req.	KS8-4	Not Req.	Not Req.	

† "CONCENTRIKIT" Equivalent: K-8 Kit with Base Elements and Shafts: B11-325, P19-013 (Panel) (Not available as a factory assembled unit.) B11-123, R15-005 (Rear)
■ "STA-LOC" Equivalent: FA36L, RU54L, OS875A, LS375. R5 (Bushing)
▲ "STA-LOC" Equivalent: FB54L, RU54L, OS900, LS437.
* Factory Assembled Part #PCQ3-133 (SKT).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R1	1meg			
R2	8.2meg			
R3	1.5meg			
R4	12K			
R5	120Ω			
R6	470Ω			
R7	56Ω			
R8	10K			
R9	470Ω			
R30	120K			
R21	120K			
R22	6800Ω			
R23	56Ω			
R24	15K			
R25	4700Ω			
R26	1000Ω			
R27	180Ω			
R28	560Ω			
R29	2200Ω			
R10	1500Ω			
R31	1200Ω			
R32	68Ω			
R33	100K			
R34	220K			
R35	3900Ω 7W	PW7-3900Ω	TW-SQ-3900	
R36	100Ω			
R37	180K			
R38	82K 2W			
R39	220K			
R40	3.3meg			
R41	22K			
R42	47K			
R43	270K			
R44	3300Ω			
R45	100K			
R46	1000Ω			
R47	68Ω			
R48	100K			
R49	3300Ω			
R50	15K			
R51	120Ω			
R52	39K			
R53	12K			
R54	12K			
R55	4.7meg			
R56	220K			
R57	220K			
R58	18Ω			
R59	470K			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R60	560Ω 2W			
R61	270K			
R62	4.7meg			
R63	150K			
R64	150K			
R65	1meg			
R66	10K			
R67	3300Ω			
R68	1meg			
R69	1meg			
R70	560Ω			
R71	22K			
R72	33K			
R73	68K			
R74	2.2meg			
R75	1meg			
R76	2.2meg			
R77	4.7meg			
R78	470K			
R79	1meg			
R80	22K			
R81	27K			
R82	33K			
R83	470K			
R84	4700Ω 2W			
R85	120Ω			
R86	560Ω			
R87	2.9Ω (Cold)			
R88	3300Ω			
R89	15K			
R90	470K			
R91	47K			
R92	6800Ω 1W			
R93	1200Ω			
R94	100K			
R95	150K			
R96	560K			
R97	33K			
R98	47K			
R99	100Ω			
R100	12K 10W	PW10-12K	10W-SQ-12K	
R101	33K			
R102	1.2meg			
R103	100K			
R104	2.2Ω			
R105	100K			
R106	4700Ω			
R107	3900Ω 10W	PW10-3900	10W-SQ-3900	
R108	3300Ω 5W	PW5-3300	5W-SQ-3300	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	41.25MC Trap	29760	TV-152	6225	RTC-8556	T28	① Wound on 3900Ω Resistor.
L2	39.75MC Trap	29760	TV-152	6225	RTC-8556	T28	② Wound on 22K Resistor.
L3	47.25MC Trap	29759	TV-153	6225	RTC-8556	T28	
L4	1st Video IF	29755	TV-131	6225	RTC-8556	T28	
L5	2nd Video IF	29585	TV-130	6219	RTC-8551	T27	③ Wound on 39K Resistor.
L6	3rd Video IF	29564	TV-153	6225	RTC-8556	T28	
L7	3rd Video IF	29585	TV-130	6219	RTC-8551	T27	
L8	4th Video IF	29585	TV-130	6219	RTC-8551	T27	
L9	RF Choke (10uh)		RC-566	4612	RTC-8522	T360	
L10	Peaking (250uh)		TV-185	6181	RTC-8598	T315	
L11	Peaking (92uh)	①	TV-181 †	6177 †	RTC-8594 †	T304 †	† Parallel with 3900Ω Resistor.
L12	4.5MC Trap	29548	TV-151	1470	RTC-8603	T349	
L13	Peaking (120uh)	②	TV-182	6178	RTC-8595	T306	
L14	Peaking (180uh)	③	TV-183	6179	RTC-8596	T309	
L15	1st Sound IF	29053C	TV-151	1469	RTC-8602	T349	
L16	2nd Sound IF	29578A	TV-151	1469	RTC-8602	T349	
L17	Ratio Detector	29694	TV-122-B	1468 RD	RTC-8600	T337	
L18	RF Choke (12uh)		RC-566	4622	RTC-8523	T881	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No.	Merit PART No.	Miller PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.
L19	Horiz. Stabilizer		TV-163	6211	RCL10	RTC-8623	HS-7	WLC-25	T103
L20	Width Coil (3-17MH)	29718	MWC-11	6329 ①	QRC-109②	WC-11 ③	WC-28 ③	WLC-8	T-119

① Do not use Tap. ② Drill new mounting hole(s). ③ Use Black and White Terminals.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (@ CURRENT 1000 ~)	REPLACEMENT DATA: Packard-Bell PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L21	.250A	40Ω	.7 Hy.	27006E	C-2343	26C44	C-34X		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA: Packard-Bell PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
	PRI.	SEC. 1	SEC. 2						
T1	117V @ 2A	540VCT @ .320A DC	5V @ 3.8A	29076				R-7TBC	① Phase and parallel 5A and 8A 6.3V windings; tape 2A 6.3V winding.
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ 10A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No.	Merit PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	Vert. Output	29501			VO-101	26S14	A-113X	
T3	Yoke (Horiz.18.2MH) ((14#) (Vert. 15MH)	29758		(PCM-2017) ①②	DY-27A ②	Y-52	Y-60-1	
	Rear Cover and Centering Device	34103						
	Yoke Clamp	28258						
T4	Horiz. Output	29527						

① Remove horizontal damping network; use original. ② Use original rear cover and centering device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: Packard-Bell PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4000Ω	3-4Ω	29498F	A-2930	A-3877	24S06	S-41X	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: Packard-Bell PART No.	QUAM PART No.	NOTES
SP1	4" x 8"	PM	3-4Ω	83132B	46A07	Used in Model 23DD3.
	6" x 9"	PM	3-4Ω	83112	69A3	Used in Model 23DC2.

MISCELLANEOUS

ITEM No.	PART NAME	REPLACEMENT DATA: Packard-Bell PART No.	NOTES
M1	Tuner	10572	VHF, STANDARD COIL REPLACEMENT #GG4290A
M2	Circuit Breaker		

PARTS LIST AND DESCRIPTIONS (Continued)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	55090	
Mask	55154	
Knob	52333	VHF Channel Selector
Knob	52329	Fine Tuning
Knob	52257	Contrast, Tone
Knob	52330	Volume
Knob	52332	Brightness
Knob	52331	Vertical Hold
Knob	52183	Pix Fidelity
Knob	52352	Disc
Cabinet	23DC2	Model 23DC2
Cabinet	23DD3	Model 23DD3

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8484 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

VHF TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	• GENERAL ELECTRIC •			RAYTHEON • SYLVANIA •	
V201	RF Amp.	6ER5/GG	V202	Mixer - Osc.	6CG8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C202	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-427	CN7-427	10TCU-Q27
C204	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C205	30							
C206	28		NPO-DI 25	TCZ-27	C10Q27C	CCTO-27	CNO-427	10TCC-Q27
C207	1000		EF-001	MFT-1000		CCF-102	CT280A	
C208	.5-3.5			829-3		CV-1	CT565	
C209	100		EF-0001	MFT-100				
C210	.5-3.5			829-3		CV-1	CT565	
C211	33		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C212	.5-3.5			829-3		CV-1	CT565	
C213	2 N150							
C214	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C215	39 NPO 10%		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C216	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C217	7.25							
C218	18		NPO-DI 20	TCZ-18	C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	
C220	1000		EF-001	MFT-1000		CCF-102	CT280A	
C221	1000		EF-001	MFT-1000		CCF-102	CT280A	

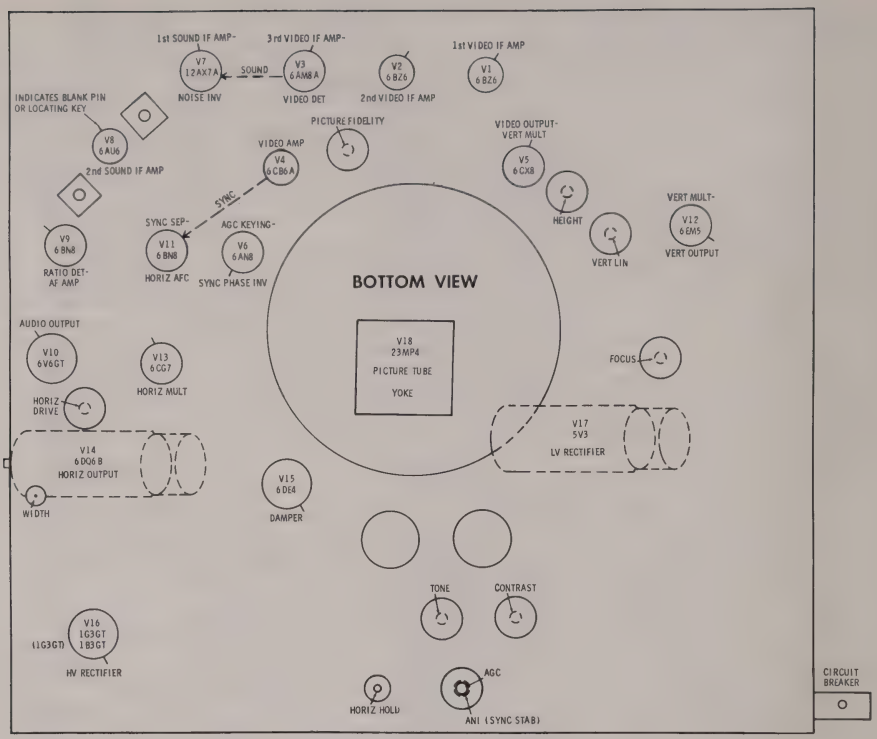
RESISTORS

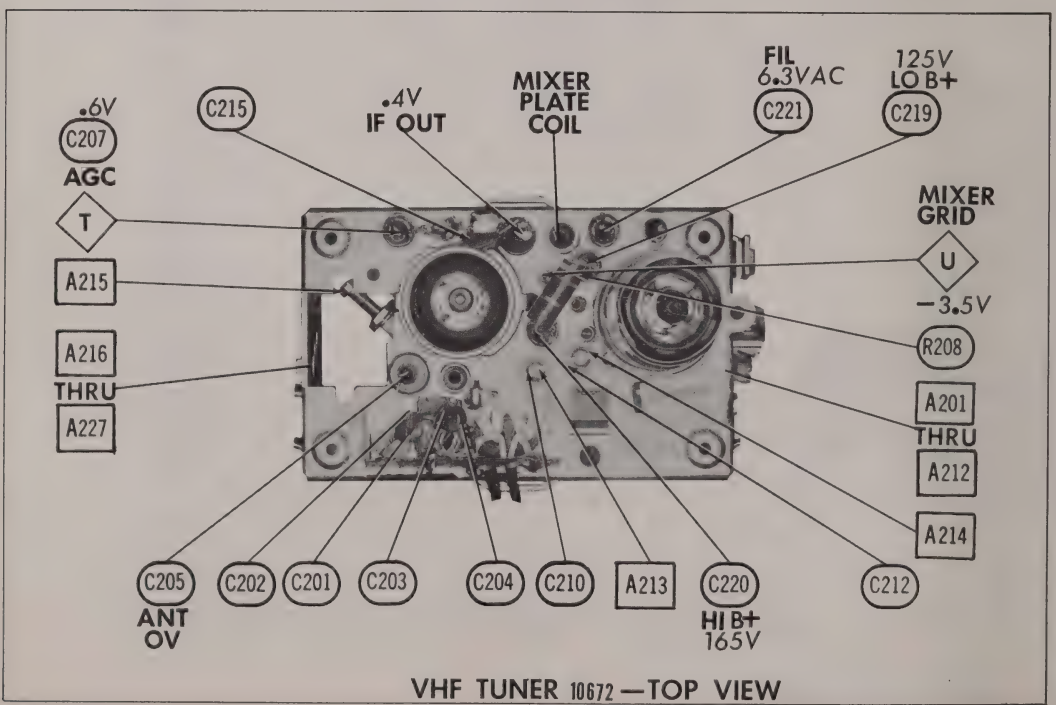
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	47K				R205	1000Ω			
R202	1000Ω				R206	4700Ω			
R203	2700Ω			(3900Ω) *	R207	4700Ω			
R204	220K				R208	4700Ω			

* Alternate Value.

TUBE PLACEMENT CHART



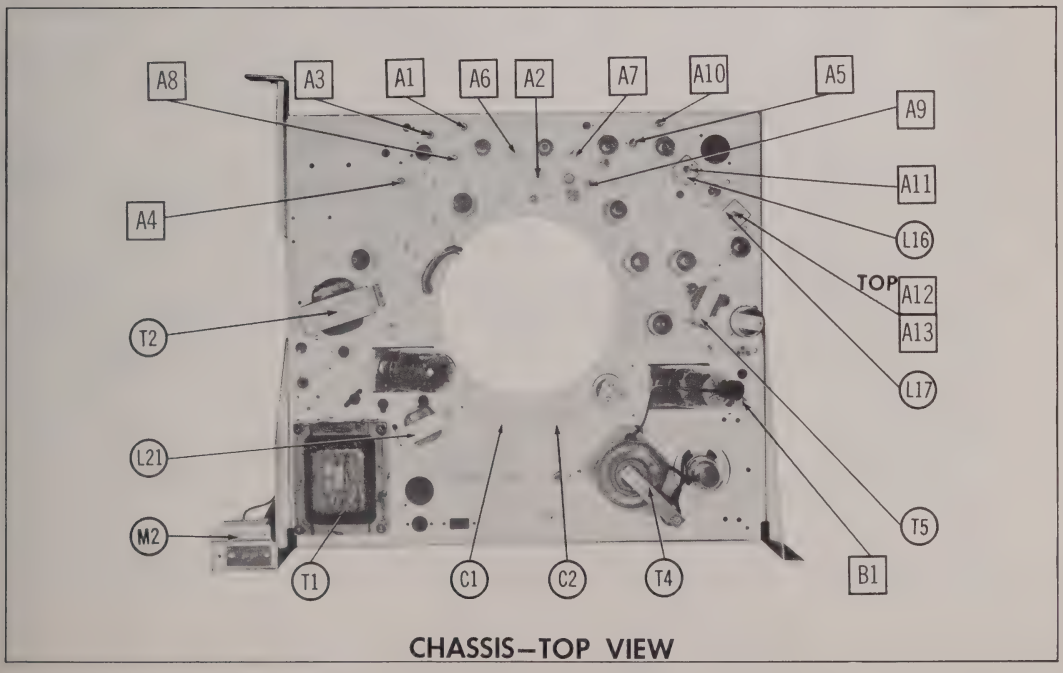


VHF TUNER 10672 —TOP VIEW

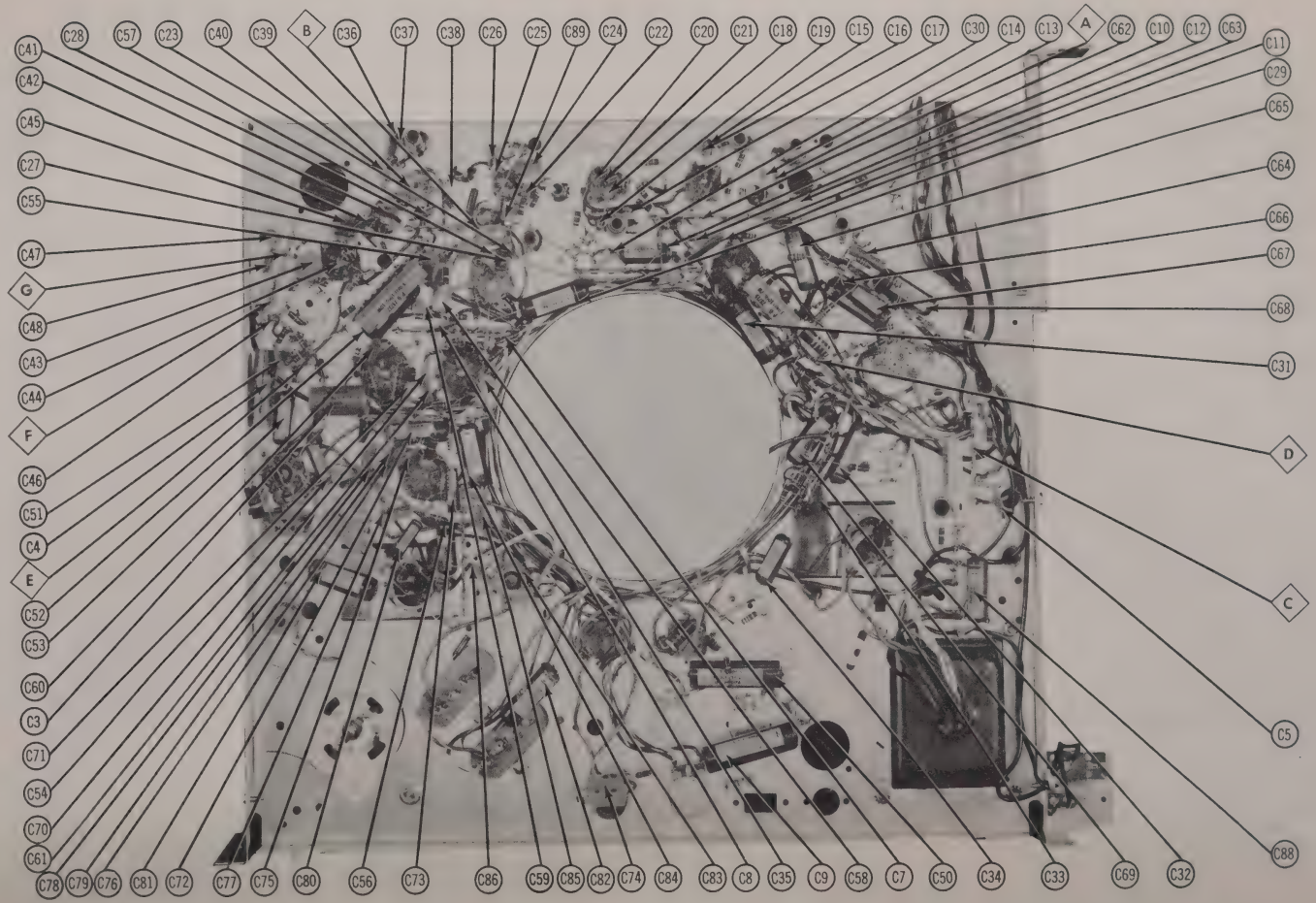
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	•70K	56Ω	FIL	FIL	▪530Ω	▪530Ω	0Ω		
V2	6BZ6	60K	65K	FIL	FIL	†510Ω	†510Ω	65K		
V3	6AM8A	180Ω	.1Ω	†4900Ω	FIL	FIL	†4900Ω	.1Ω	2800Ω	0Ω
V4	6CB6A	2800Ω	68Ω	FIL	FIL	†5600Ω	†3900Ω	0Ω		
V5	6CX8	0Ω	•1.8meg	•†2.5meg	FIL	FIL	•300Ω	220K	†3900Ω	†3900Ω
V6	6AN8	†14K	†1.1meg	3300Ω	FIL	FIL	•300K	†40Ω	†55K	†3900Ω
V7	12AX7A	†110K	•150K	2200Ω	FIL	FIL	†4900Ω	100K	68Ω	FIL
V8	6AU6	100K	0Ω	FIL	FIL	†7200Ω	†22K	120Ω		
V9	6BN8	INF	0Ω	INF	FIL	FIL	24K	†440K	4.7meg	18Ω
V10	6V6GT	NC	FIL	†450Ω	†40Ω	470K	TP	FIL	560Ω	
V11	6BN8	2meg	1meg	1meg	FIL	FIL	560Ω	†100K	4.7meg	0Ω
V12	6EM5	†470Ω	NC	NC	FIL	FIL	•3meg	0Ω	NC	†760Ω
V13	6CG7	†6800Ω	2.5meg	1200Ω	FIL	FIL	†150K	100K	1200Ω	0Ω
V14	6DQ6B	TP	FIL	NC	†12K	•750K	TP	FIL	0Ω	TOP CAP †17Ω
V15	6DE4	NC	TP	1.8meg	NC	†40Ω	NC	FIL	FIL	
V16	1G3GT 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †350Ω
V17	5V3	NC	¶	NC	27Ω	NC	29Ω	NC	¶	
V18	23MP4	FIL	220K	†1.1meg	•†150K	NC	NC	•100K	FIL	
V20	16ER5 GG	0Ω	2.2meg	FIL	FIL	†43^0Ω	0Ω	0Ω		
V21	6CG8A	4700Ω	†12K	0Ω	FIL	FIL	†4300Ω	†8000Ω	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

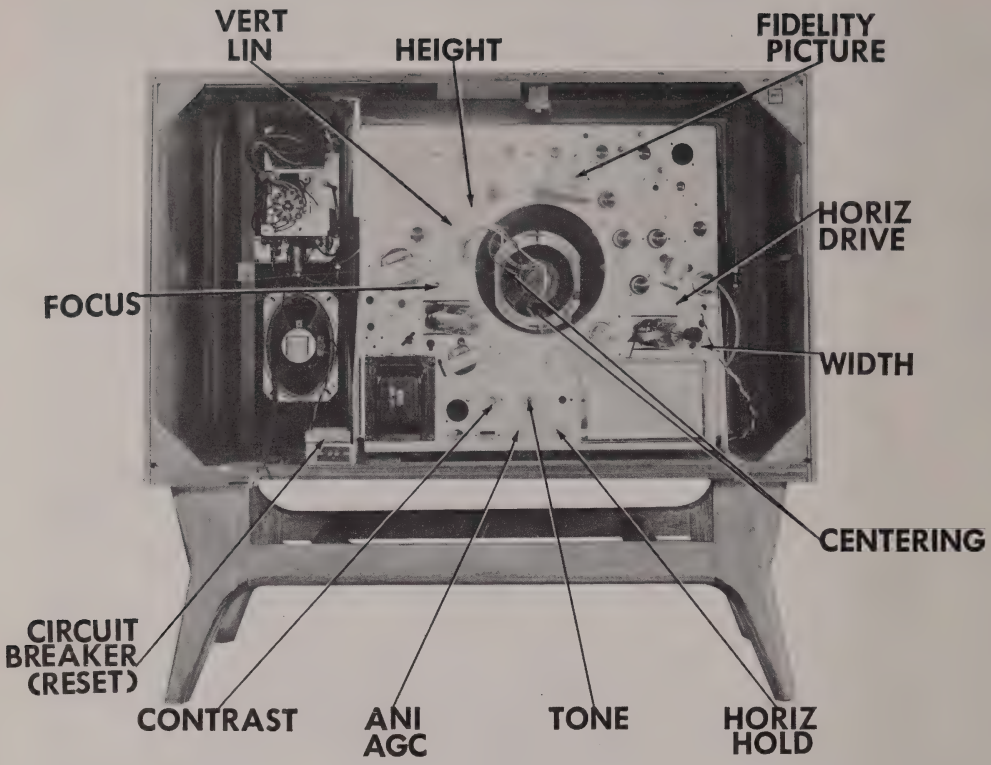
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 8 OF V17. ▪ MEASURED FROM PIN 2 OF V2.
† MEASURED FROM PIN 3 OF V15. NC NO CONNECTION TP TIE POINT



CHASSIS—TOP VIEW



CHASSIS BOTTOM VIEW - ALIGNMENT, CAPACITOR IDENT.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast for a normal picture.

Turn the Horizontal Hold (Freq. Slug) clockwise until the picture loses sync. It may be necessary to switch off channel and back again for the picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the Horizontal Drive Control until the white lines disappear.

If the Horizontal Drive was adjusted, tune in a TV station and readjust the Horizontal Hold as above.

Adjust the Adjust Width Slug (B1) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Disconnect antenna leads. Remove 3 knobs at front of set.
2. Remove 6 wood screws holding rear cover. Remove rear cover.
3. Disconnect picture tube socket, yoke, high voltage lead, speaker plug.
4. Remove 2 screws holding Tuner. Remove pilot lamp panel.
5. Remove 4 chassis screws (2 at bottom, and 2 at top). Remove ground spring from picture tube to chassis.
6. Remove chassis and Tuner.

PICTURE TUBE REMOVAL

It is necessary to remove the chassis for picture tube removal.

PHOTOFACT® Folder

PRODUCTION CHANGE BULLETIN 263

PRODUCTION CHANGE BULLETIN 263

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 19 IN SET 500

ZENITH MODEL ROYAL 710LG (CH. 7GT43Z1)

Zenith Model Royal 710L (Ch. 7CT43Z1) was covered in PHOTOFACT Folder 19 - Set 500.

Model Royal 710LG (Ch. 7GT43Z1) is electrically similar except for the following changes.

COMPONENT CHANGES

X1 (Mixer) is changed to a Type 2N1108 (Part #121-145).

X3 (1st IF Amp.) is changed to a Type 2N1110 (Part #121-146).

X4 (2nd IF Amp.) is changed to a Type 2N1111 (Part #121-147).

X6 and X7 (Output) are changed to a Type 2N1374 (Part #121-184).

L3 (1st IF Transformer) is changed to Part #95-1750.

L4 (2nd IF Transformer) is changed to Part #95-1748.

L5 (3rd IF Transformer) is changed to Part #95-1749.

T1 (Driver Transformer) is changed to Part #95-1882.

T2 (Output Transformer) is changed to Part #95-1863.

R15 is increased from 1000Ω to 2200Ω.

C2 is changed to a 5mfd @ 12 volts (Part #22-2884).

R19 is increased from 47K to 56K.

R20 is increased from 4700Ω to 10K.

(Continued On The Reverse Side)

PRODUCTION CHANGE BULLETIN 263

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 6 IN SET 493

EMERSON MODELS 919B, 927B (CH. 120484B, 120504B)

Emerson Models 876B, 881B, 883B, 915B, 916B, 917B, 918B, 924B (Ch. 120474B, 120475B, 120479B, 120484B, 120487B) were covered in PHOTOFACT Folder 6 - Set 493.

Models 919B, 927B (Ch. 120484B, 120504B) are electrically similar except for the following changes. A listing of Cabinets and Cabinet Parts is also given in this bulletin.

Ch. 120504B

COMPONENT CHANGES

M1 (Tuning Capacitor) is Part #900198.

R1 (Volume Control & Switch) is changed to Part #390605.

(Continued On The Reverse Side)

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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

R21 is decreased from 680Ω to 330Ω.

R22 is decreased from 3300Ω to 1800Ω.

R25 is decreased from 5600Ω to 4300Ω 5%.

C18 and C19 are omitted.

COMPONENTS ADDED

A .22mfd capacitor is added between the Collectors of X6 and X7.

The wire connecting the Emitters of X6 and X7 is disconnected. R28 connects to ground from the Emitter of X6. Another 4.7Ω resistor is connected to ground from the Emitter of X7.

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	461182	Tuning, Model 919B
Knob	461175	Tuning, Model 927B
Knob	461181	Volume, Model 919B
Knob	461176	Volume, Model 927B
Knob	461254	Pushbutton, Auto, Model 919B
Knob	461255	Pushbutton, On, Model 919B
Knob	461256	Pushbutton, Off, Model 919B
Knob	461257	Pushbutton, Doze Sleep, Model 919B
Clock & Radio Dial	413758	Model 919B
Clock Timer	471210	Model 919B
Cabinet	141099	Pink, Model 919B
Cabinet	140856	Pink, Model 927B
Cabinet	141099B	Turquoise, Model 919B
Cabinet	140856B	Turquoise, Model 927B
Cabinet	141099D	Ebony, Model 919B
Cabinet	140856D	Ebony, Model 927B
Cabinet	141099E	Ivory, Model 919B
Cabinet	140856E	Ivory, Model 927B

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 IN SET 503		EMERSON MODELS 922B, 923B (CH. 120492B, 120493B)
	Emerson Models 901D, 903B, 904B, 905B, 906B, 971A, 972, 973 (Ch. 120458B, 120462B, 120467B, 120471B, 120473B) were covered in PHOTOFACT Folder 10 - Set 503. Models 922B, 923B (Chassis 120492B, 120493B) are electrically similar except for the following changes.	
Ch. 120492B	COMPONENT CHANGES C16 is decreased from .047mfd to .022mfd. C3 is decreased from .047mfd to .033mfd. A partial schematic diagram showing the changes in the speaker circuitry is given in this bulletin.	
Ch. 120493B	SPEAKER CHANGE Model 922B uses a single 6" speaker (Part #180193) for each channel. A 15meg resistor is added from the CircuiTrace point 18 to the junction of C4 and the input socket.	

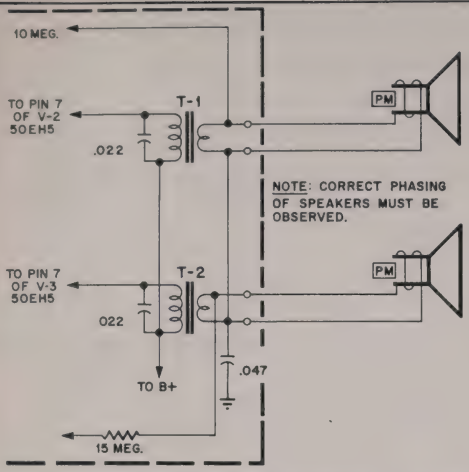
(Continued On The Reverse Side)

CABINETS & CABINET PARTS

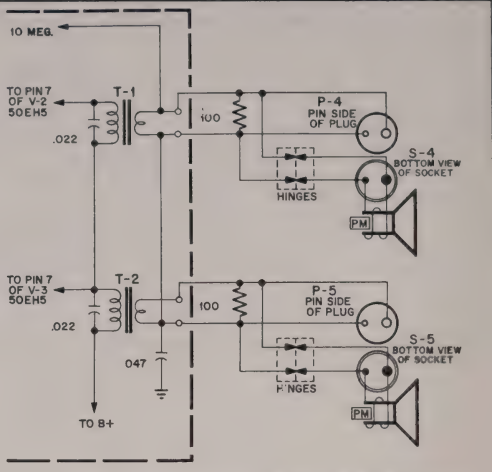
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	461093	Volume (Outer) Models 922B, 923B
Knob	461094	Volume (Inner) Models 922B, 923B
Knob	461095	Tone, Off-On, Model 922B
Knob	461095	Bass, Treble, Model 923B
Knob	461108	Off-On, Model 923B
Knob	461147	Stereo/Mono, Model 923B
Cabinet	141061	Mahogany, Model 922B
Cabinet	141061A	Limed Oak, Model 922B
Cabinet	141061B	Walnut, Model 922B
Cabinet	141093	Black & White, Model 923B
Cabinet	141093A	Blue & White, Model 923B
Adaptor	960360	45 RPM, Model 922B
Adaptor	962490	45 RPM, Model 923B
Brass Legs	413681	Model 922B

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 1 IN SET 514		AIRLINE MODELS WG-5203B, WG-5205B, WG-5213B, WG-5303B, WG-5305B, WG-5313B
	Airline Models WG-5203A, WG-5205A, WG-5213A, WG-5303A, WG-5305A, WG-5313A were covered in PHOTOFACT Folder 1 - Set 514. Models WG-5203B, WG-5205B, WG-5213B, WG-5303B, WG-5305B, WG-5313B are electrically similar except for the following changes.	
	COMPONENT CHANGES R14 is increased from 6800Ω to 47K. C11 is decreased from 680mmf to 390mmf. V15 (Picture Tube) is changed to a Type 23MP4. In some versions R7 is 50K, R64 is 68K, R65 is 22K. In some versions R7 is 100K, R64 is 22K, R65 is 22K. In some versions R7 is 150K, R64 is replaced with a jumper wire, R65 is replaced with a jumper wire. An 820K resistor is added from the junction of R69 and R70 to Pin 8 of V11 (6CG7). R88 is decreased from 15K 2 watt to 12K 2 watt.	



SPEAKER PORTION, SCHEMATIC, CH-120493B



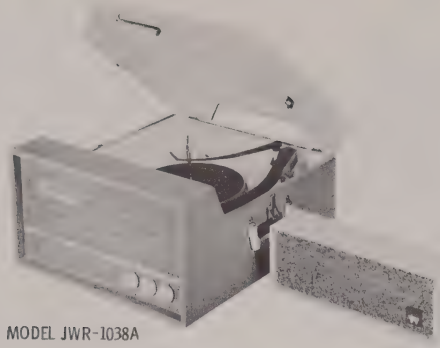
SPEAKER PORTION, SCHEMATIC, CH-120492B

Partial Schematic Diagrams Courtesy of The Dumont Emerson Corporation

PHOTOFACT® Folder

AIRLINE MODELS JWR-820A, JWR-1038A

AIRLINE MODELS
JWR-820A, JWR-1038A

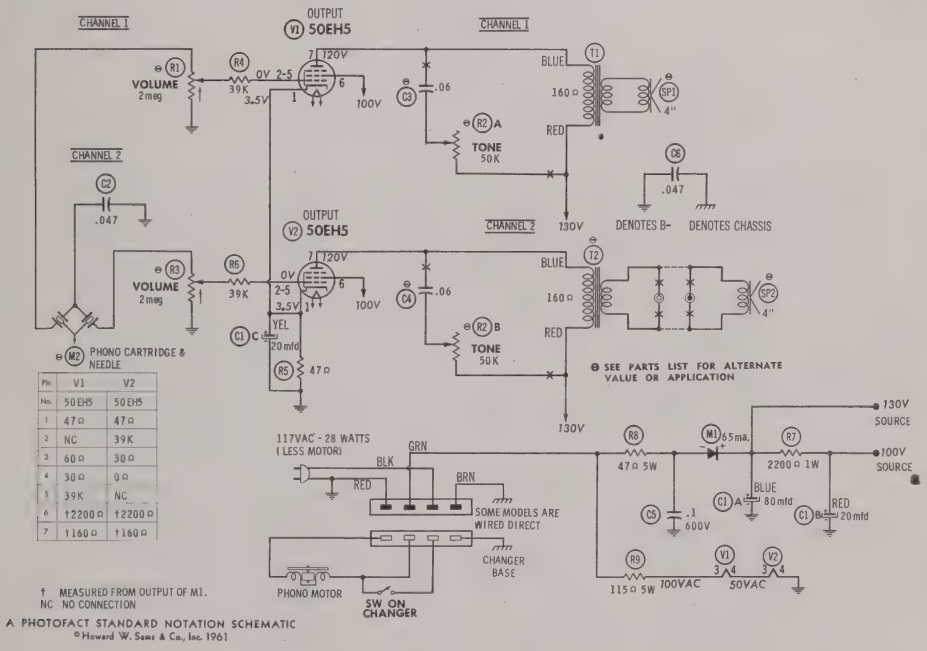


MODEL JWR-1038A

TRADE NAME	Airline Models JWR-820A, JWR-1038A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Avenue, Chicago 7, Illinois
TYPE SET	AC Operated 2 Tube Stereo Phono Amplifier
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 28 Watts, .3 Amp. @ 117 Volts AC (Less Motor)

MODEL JWR-820A HAS A 4 SPEED MANUAL RECORD PLAYER
MODEL JWR-1038A HAS A 4 SPEED AUTOMATIC RECORD CHANGER. FOR SERVICE INFORMATION SEE SIMILAR V-M1201 – PHOTOFACT SET 436 OR RECORD CHANGER MANUAL RC-12

AIRLINE MODELS
JWR-820A, JWR-1038A



Pin	V1	V2
No.	50EH5	50EH5
1	47Ω	47Ω
2	NC	39K
3	60Ω	30Ω
4	30Ω	0Ω
5	39K	NC
6	†2200Ω	†2200Ω
7	†160Ω	†160Ω

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SET 538 FOLDER 4

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 Output	50EH5	V2	Channel 2 Output	50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	12145	PRS4650	BBRT84215	WQ230	TDLT-7	TVA-3437.1	
B	20	150							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C3	.06 200V	Note 1	P288N-06		CUB6S6	6DP-3-603	GEM-416	6TM-S60
C4	.06 200V	Note 1	P288N-06		CUB6S6	6DP-3-603	GEM-416	6TM-S60
C5	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C6	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47

Note 1. Not used in Model JWR-820A.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg	½	12400①	B-76				Volume, Channel 1
B	Bushing			AK-31				
R2A	50K	½	13650②	B-32			FB54A	Tone, Channel 1
B	50K	½		SR-32			RU54A	Tone, Channel 2
C	Shaft			Not Req.			CS3500	
R3A	2meg	½	12400③	B-76				Volume, Channel 2
B	Bushing			AK-31				

① Model JWR-820A uses Part #13786 in this application.
② Not used in Model JWR-820A.
③ Model JWR-820A uses Part #13069 in this application (with switch).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	39K				R7	2200Ω 1W			
R5	47Ω				R8	47Ω 5W	PW5-47	5W-SQ-47	
R6	39K				R9	115Ω 5W	PW5-115	5W-SQ-115	

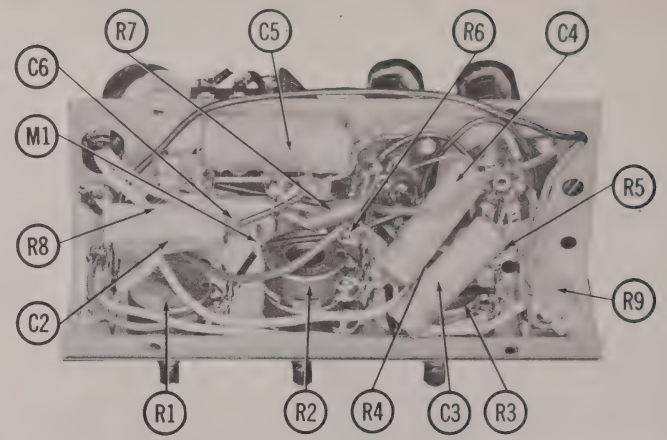
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3400Ω	3-4Ω	(Part of SP1)	A-3025	A-3332	24S48	S-16X	* Part #13649 used in Model JWR-820A
T2	3400Ω	3-4Ω	13706 *	A-3025	A-3332	24S48	S-16X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	13969 *	4A07	* Includes T1. Model JWR-1038A
SP2	4"	PM	3-4Ω	11792	4A07	♦ Includes T1. Model JWR-820A
	4"	PM		13897 ♦		

CHASSIS—BOTTOM VIEW



POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	AIRLINE PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.065A	13782	1N1763	2F4	SR200	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	AIRLINE PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2	60-70	CRA-55X* (LP)	70TS	N8-7 *	96T	Not Req.	12TH-S	Not Req.	Model JWR-1038A ① Includes Tone Arm
		CRA-55 (78 RPM)		N8-3 *			T8C1-12TH-S ①		
	60-82	CRA-55X* (LP)	74TS K74TS①	N8-7 *	96T	Not Req.	12TH-S	Not Req.	Model JWR-820A ① Includes Tone Arm
		CRA-55 * (78 RPM)		N8-3 *					

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
	Motor	13745-8	(Alliance)
	Motor	13746-8	(G.I.)

WIRING DATA

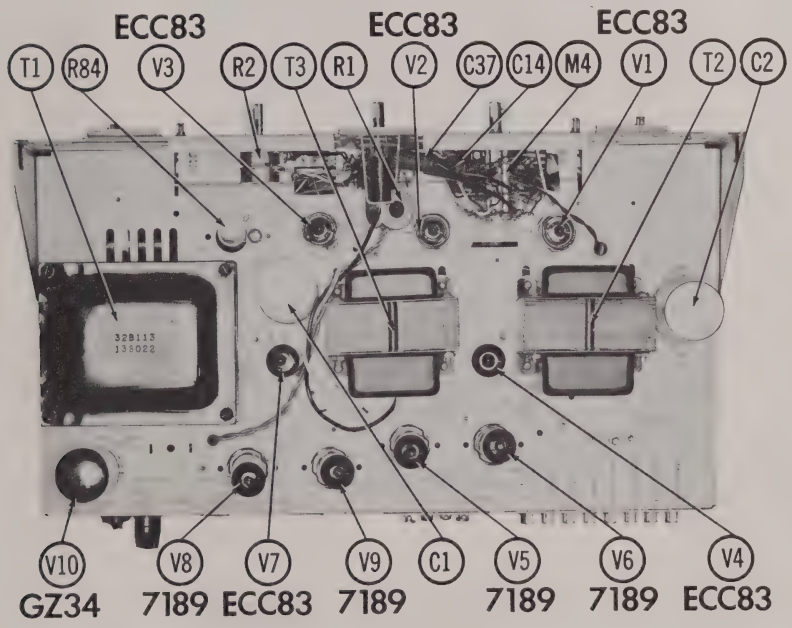
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

**BELL SOUND
MODEL 2440**

BELL SOUND
MODEL 2440

TRADE NAME	Bell Model 2440
MANUFACTURER	Bell Sound Div., Thompson Ramo Wooldridge Inc., 555 Marion Road, Columbus 7, Ohio
TYPE SET	AC Operated 10 Tube Stereo Amplifier
POWER SUPPLY	110 — 120 Volts AC, 60 Cycles RATING 115 Watts, 1 Amp. @117 Volts AC



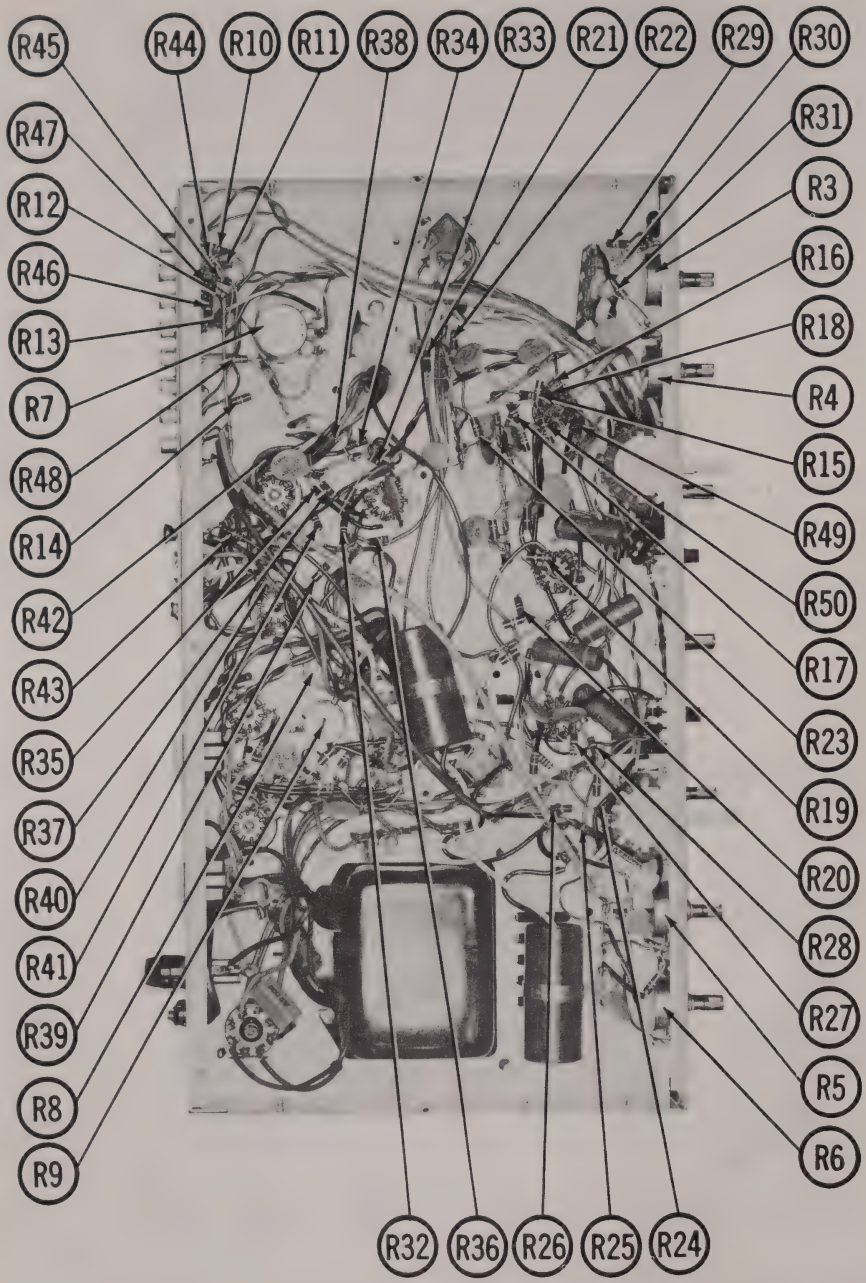
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

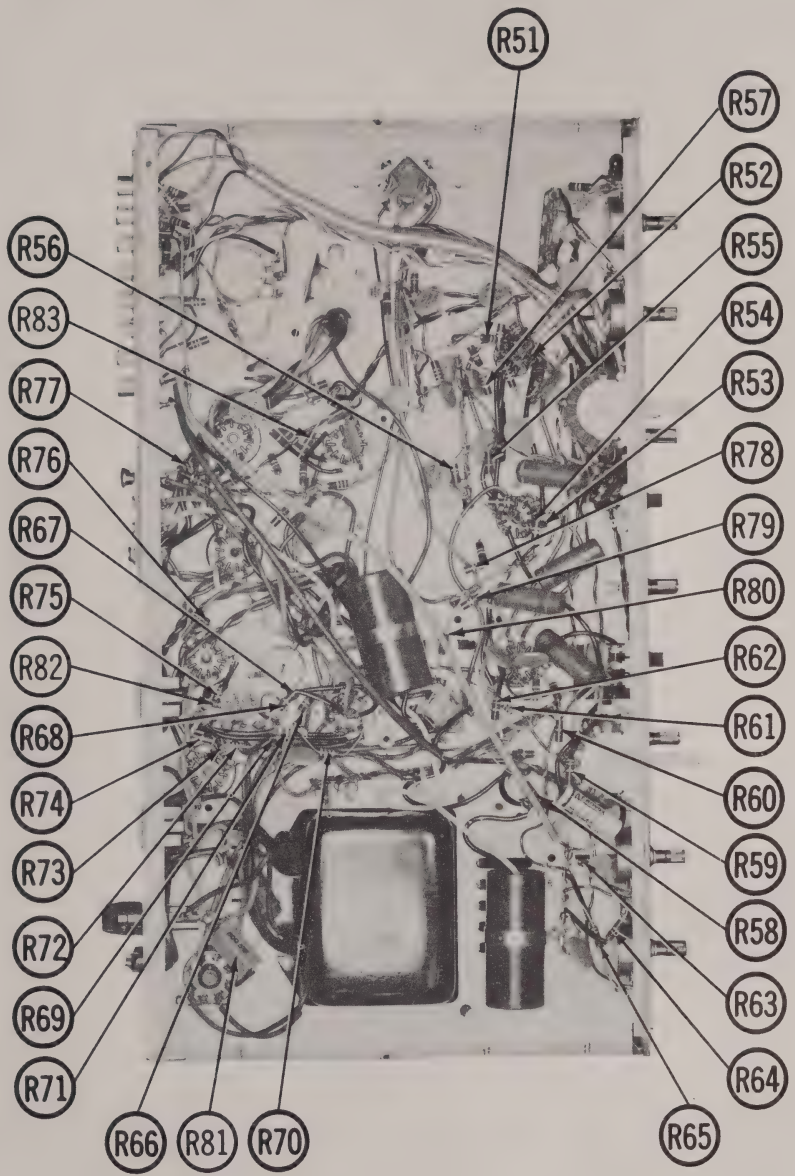
KV533

DATE 7—61

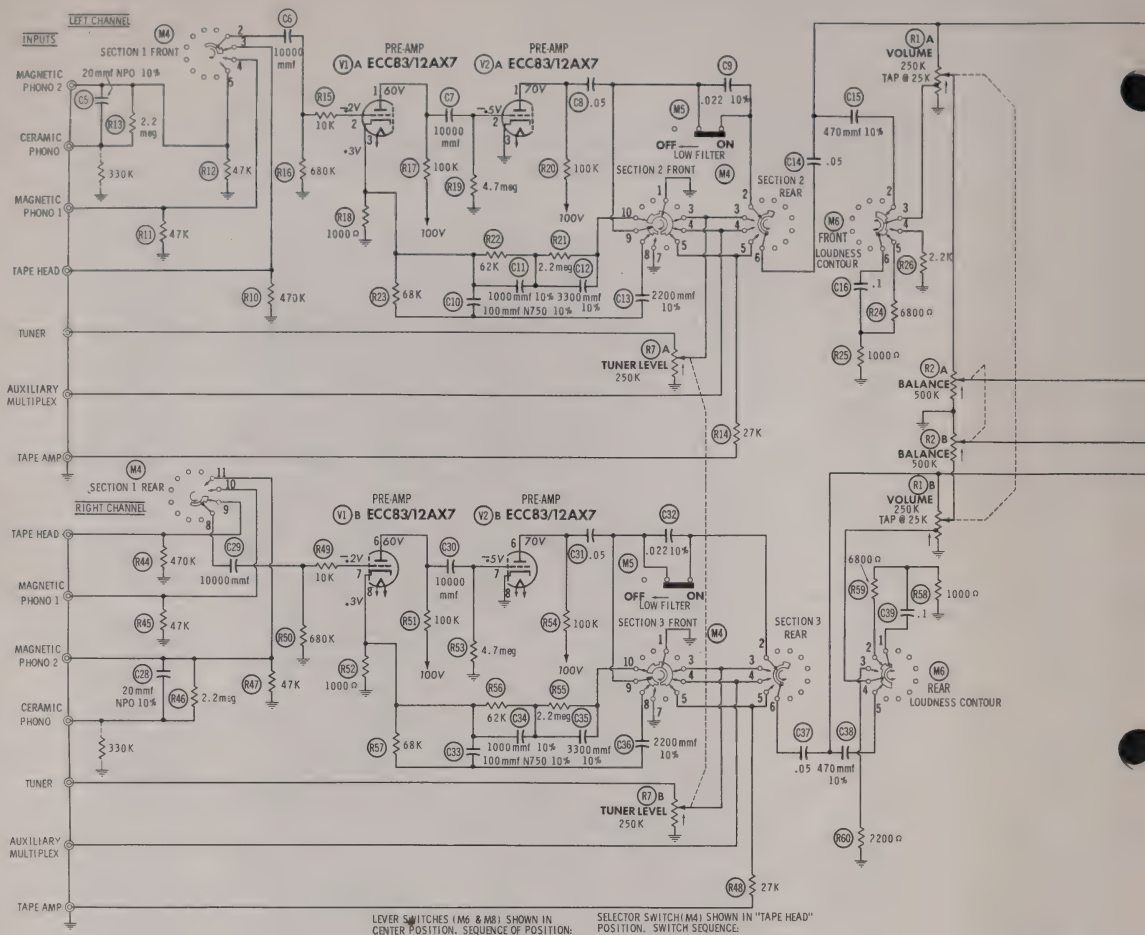
SET 538 FOLDER 5



CHASSIS BOTTOM VIEW-RESISTOR IDENT. (R3 Thru R50)



CHASSIS BOTTOM VIEW-RESISTOR IDENT. (R51 Thru R83)



LEVER SWITCHES (M6 & M8) SHOWN IN CENTER POSITION. SEQUENCE OF POSITION:

(M8)	(M6)
LEFT - MONAURAL	LEFT - 0
CENTER - STEREO	CENTER - 1
RIGHT - REVERSE	RIGHT - 2

SELECTOR SWITCH (M4) SHOWN IN "TAPE HEAD" POSITION. SWITCH SEQUENCE:

1. TAPE HEAD
2. PHONO 1
3. PHONO 2
4. TUNER
5. AUXILIARY - MULTIPLEX
6. TAPE AMP.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	†230K	690K	1000Ω	0Ω	10Ω	†230K	690K	1000Ω	NC
V2	ECC83 12AX7	†230K	4.7meg	0Ω	0Ω	10Ω	†230K	4.7meg	0Ω	NC
V3	ECC83 12AX7	†80K	50K	680K	10Ω	10Ω	†80K	50K	680Ω	12Ω
V4	ECC83 12AX7	†57K	1meg	52K	20Ω	12Ω	†160K	50K	1300Ω	NC
V5	7189	270K	NC	30Ω	0Ω	.1Ω	NC	†120Ω	TP	†1000Ω
V6	7189	270K	NC	30Ω	0Ω	.1Ω	NC	†152Ω	TP	†1000Ω
V7	ECC83 12AX7	†57K	1meg	52K	20Ω	12Ω	†160Ω	50K	1300Ω	NC
V8	7189	270K	NC	30Ω	0Ω	.1Ω	NC	†120Ω	TP	†1000Ω
V9	7189	270K	NC	30Ω	0Ω	.1Ω	NC	†152Ω	TP	†1000Ω
V10	GZ34 5AR4	NC	¶ 100K	¶ 100K	29Ω	NC	27Ω	NC	¶ 100K	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
▬ MEASURED FROM CATHODE.
† MEASURED FROM PIN 3 OF V10.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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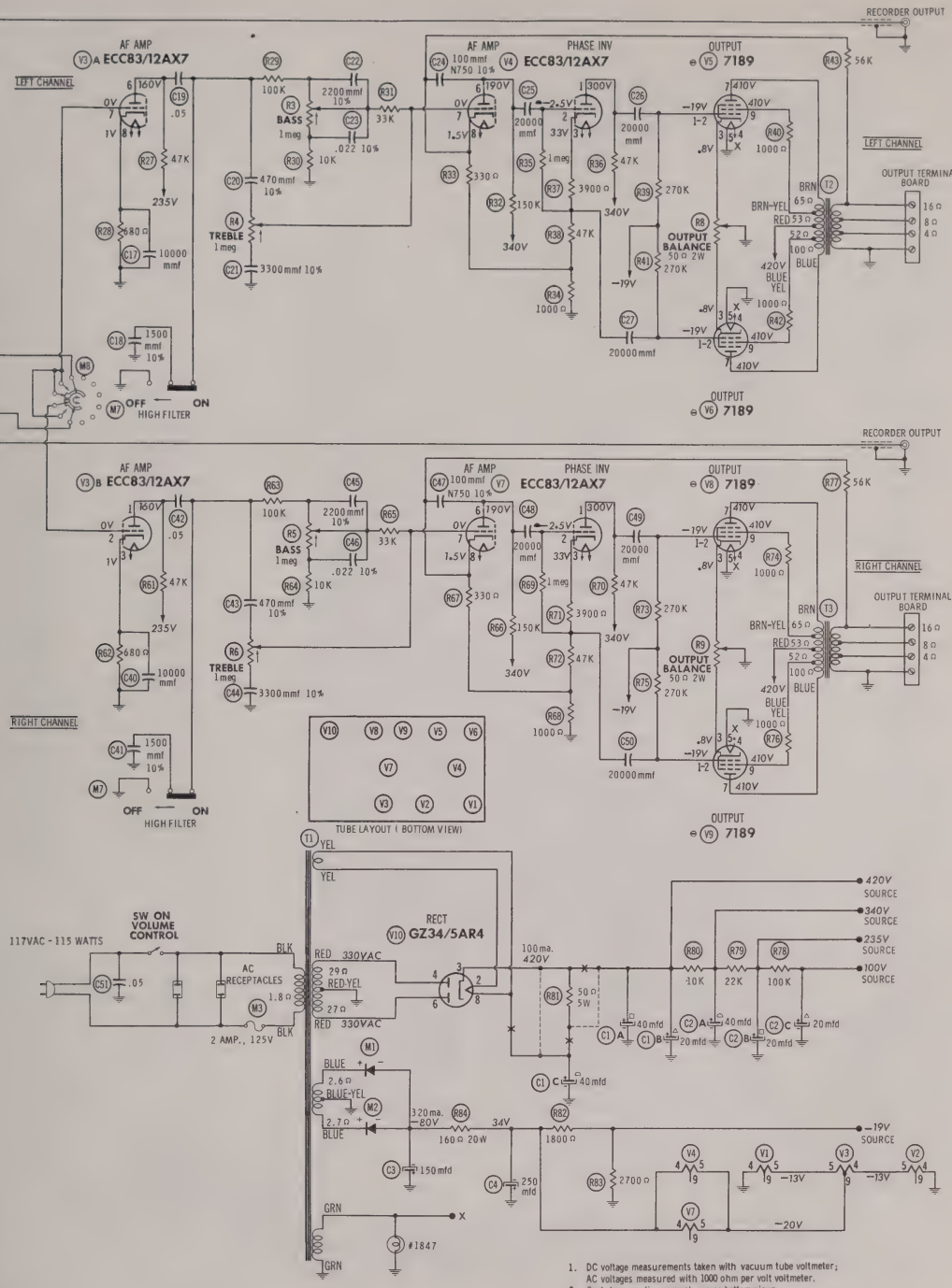
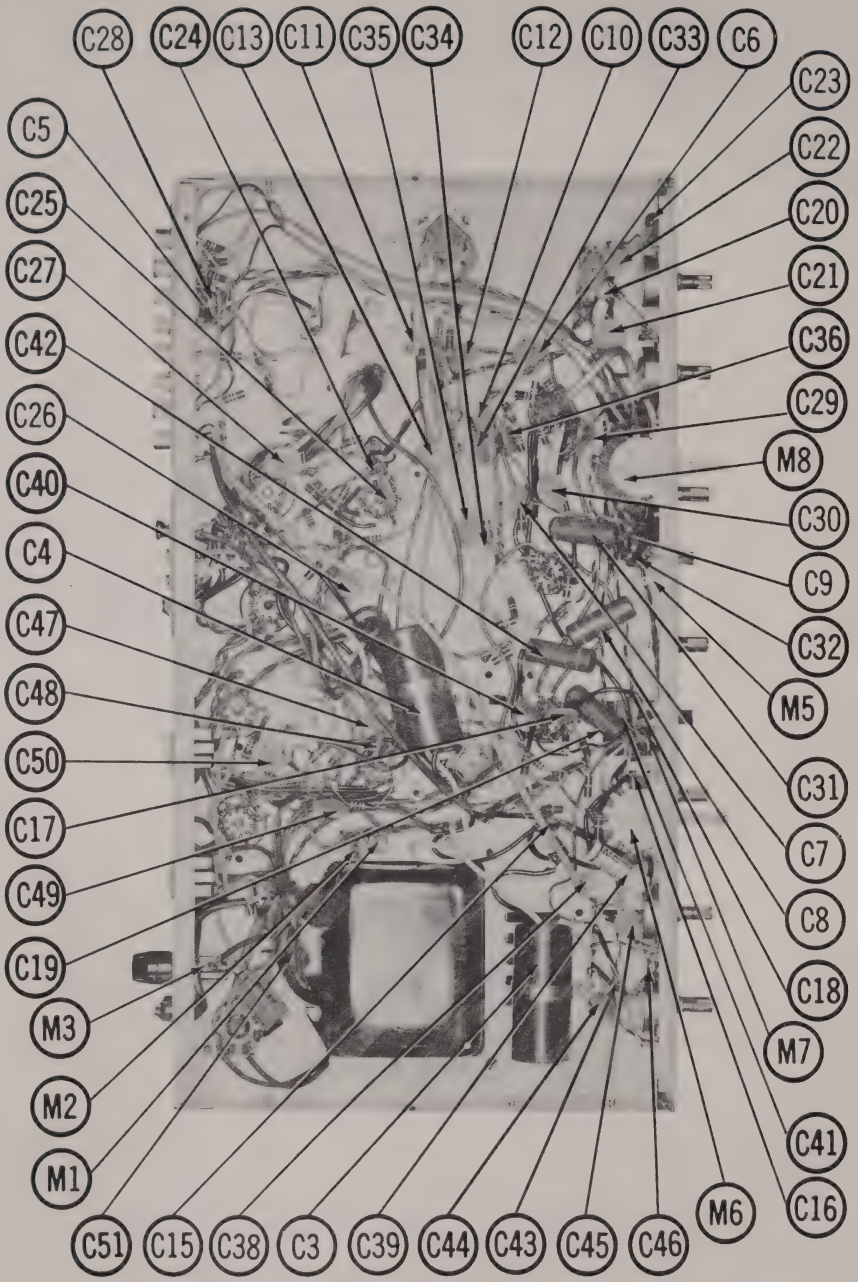


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

BELL SOUND MODEL 2440



CHASSIS BOTTOM VIEW-CAPACITOR & MISC. IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V1	Left Channel Preamp. - Right Channel Preamp.	ECC83/12AX7
V2	Left Channel Preamp. - Right Channel Preamp.	ECC83/12AX7
V3	Left Channel AF Amp. - Right Channel AF Amp.	ECC83/12AX7
V4	Left Channel AF Amp. - Left Channel Phase Inv.	ECC83/12AX7
V5	Left Channel Output	7189 (7189A) *
V6	Left Channel Output	7189 (7189A) *
V7	Right Channel AF Amp. - Right Channel Phase Inv.	ECC83/12AX7
V8	Right Channel Output	7189 (7189A) *
V9	Right Channel Output	7189 (7189A) *
V10	Rectifier	GZ34/5AR4

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BELL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■40	450	23B87	AFH3-43-50	C0330	FP376.9	TMT-3745	TVL-3786	
B	▲20	450							
C	▬40	450							
C2A	▬40	450	23B97	AFH3-42	C0330	FP376.9	TMT-3739	TVL-3784	
B	■20	350							
C	▲20	350							
C3	150	150	23A99	PRS1520	BR15015	TC495	TD-150-150	TVA-1422	
C4	250	50	23B23	PRS1380	BR2505	TC50025	TD-250-50	TVA-1312	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	20 NPO 10%		NPO-DI 20	DTZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C9	.022 50V 10%		V84C2S22-10%		PM6S22	1DP-1-223		2TM-S22
C10	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCC-T10
C11	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C12	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C13	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C14	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C15	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C16	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	1500		DI-1500	DD-153	PM6D15	CCD-152	GP215	10TS-D15
C19	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C20	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C21	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C22	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C23	.022 50V 10%		V84C2S22-10%		PM6S22	1DP-1-223		2TM-S22
C24	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C25	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C26	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C27	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C28	20 NPO 10%		NPO-DI 20	DTZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C29	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C31	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C32	.022 50V 10%		V84C2S22-10%		PM6S22	1DP-1-223		2TM-S22
C33	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C34	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C35	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C36	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C37	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C38	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C39	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C40	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C41	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C42	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C43	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C44	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C45	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C46	.022 50V 10%		V84C2S22-10%		PM6S22	1DP-1-223		2TM-S22
C47	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C48	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C49	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C50	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C51	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BELL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K	½	15A90					Volume, Left Channel
	25K Tap							
B	250K	½						Volume, Right Channel
	25K Tap							
C	Switch							Push-Pull Off-On
R2A	500K	½	15A98	B-60	AD47-500K-Z		FA55A	Balance, Left Channel
B	500K	½		SR-60	Not Req.		RU55A	Balance, Right Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R3A	1meg	½	15A92	B-70	A47-1meg-Z	Q13-137	U53	Bass, Left Channel
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	1meg	½	15A92	B-70	A47-1meg-Z	Q13-137	U53	Treble, Left Channel
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R5A	1meg	½	15A92	B-70	A47-1meg-Z	Q13-137	U53	Bass, Right Channel
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R6A	1meg	½	15A92	B-70	A47-1meg-Z	Q13-137	U53	Treble, Right Channel
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R7A	250K	½	15A96	F1-35		† QJ-1536R	■ UE 4220	Tuner Level, Left Channel
B	250K	½		R2-35				Tuner Level, Right Channel
R8	50Ω	2(WW)	15A95					Output Balance, Left Channel
R9	50Ω	2(WW)	15A95					Output Balance, Right Channel

† "CONCENTRIKIT" Equivalent: K-8 Kit with Base Elements and Shafts: (Not available as a factory assembled unit). B13-130, P9-018, (Panel) B13-130, R11-028, (Rear) R5 (Retainer)

■ "STA-LOC" Equivalent: FA254A, RU254A, OK500, IK875

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS	ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R10	470K				R26	2200Ω			
R11	47K				R27	47K			
R12	47K				R28	680Ω			
R13	2.2meg				R29	100K			
R14	27K				R30	10K			
R15	10K				R31	33K			
R16	680K				R32	150K			
R17	100K				R33	330Ω			
R18	1000Ω				R34	1000Ω			
R19	4.7meg				R35	1meg			
R20	100K				R36	47K			
R21	2.2meg				R37	3900Ω			
R22	62K				R38	47K			
R23	68K				R39	270K			
R24	6800Ω				R40	1000Ω			
R25	1000Ω				R41	270K			

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R42	1000Ω			
R43	56K			
R44	470K			
R45	47K			
R46	2.2meg			
R47	47K			
R48	27K			
R49	10K			
R50	680K			
R51	100K			
R52	1000Ω			
R53	4.7meg			
R54	100K			
R55	2.2meg			
R56	62K			
R57	68K			
R58	1000Ω			
R59	6800Ω			
R60	2200Ω			
R61	47K			
R62	680Ω			
R63	100K			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R64	10K			
R65	33K			
R66	150K			
R67	330Ω			
R68	1000Ω			
R69	1meg			
R70	47K			
R71	3900Ω			
R72	47K			
R73	270K			
R74	1000Ω			
R75	270K			
R76	1000Ω			
R77	56K			
R78	100K			
R79	22K			
R80	10K			
R81	50Ω 5W	PW5-50	5W-SQ-50	
R82	1800Ω			
R83	2700Ω			
R84	160Ω 20W	PW20-160	20W-SQ-160	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	BELL PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V@ 1A	660VCT @ .100A DC	5V@ 1.9A	32B113 ①					① Part #32B120 used in 50% versions.
	SEC. 3	SEC. 4	SEC. 5						
	6.3V@ 3.2A	125VCT @ .32ADC							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	BELL PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9000Ω CT Tap@ 1600Ω CT	16Ω Tap@ 8Ω, 4Ω	32B112					
T3	9000Ω CT Tap@ 1600Ω CT	16Ω Tap@ 8Ω, 4Ω	32B112					

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	BELL PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.320A	42A13	1N1763	5F4	SR500	Silicon
M2	.320A	42A13	1N1763	5F4	SR500	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BELL PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG	2A 125V S/B	53A16	53A8	313002 (3AG 2A 125V) S/B	342001	MDL 2	HKP

MISCELLANEOUS

ITEM No.	PART NAME	BELL PART No.	NOTES
M4	Switch	43A82	Selector (Rotary Type)
M5	Switch	43A45	Lo Filter (DPDT Slide Type)
M6	Switch	43A83	Loudness Contour (Lever Type)
M7	Switch	43A45	Hi-Filter (DPDT Slide Type)
M8	Switch	43B42	Mono-Stereo-Reverse (Lever Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	84A59	Balance, Volume
Knob	84A61	Tone
Knob	84A62	Levers
Knob	84A70	Selector

WIRING DATA

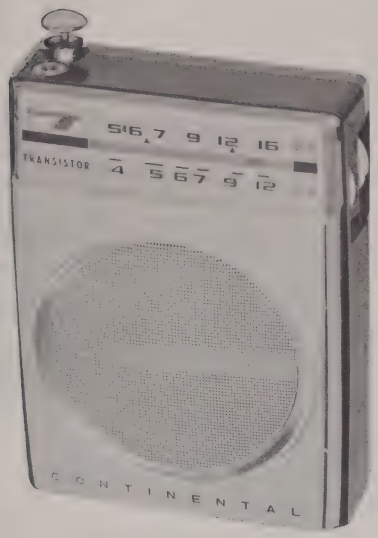
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

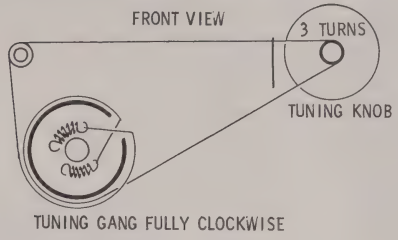
PHOTOFACT® Folder with CIRCUITRACE®

CONTINENTAL
MODEL TR-751

CONTINENTAL
MODEL TR-751



DRIVE CORD STRINGING



CONTINENTAL
MODEL TR-751

TRADE NAME	Continental Model TR-751
IMPORTER	Continental Merchandise Co., Inc., 236 Fifth Ave., New York 1, N. Y.
TYPE SET	Battery Operated Transistorized Portable BC-SW Receiver
POWER SUPPLY	9 Volts DC RATING 7MA @ 9 Volts DC (No Signal, Min. Volume)
	15MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	525-1605KC SHORT WAVE 4—12MC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: A1, A2, A3, A5..... GENERAL CEMENT #8607, 9291, 9294
WALSCO #2520, 2522, 2523, 2524, 2534, 2537

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	(BC) Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	Adjust for maximum output.
3.	"	600KC	600KC	"	A5, A6	"
4.	"	1400KC	1400KC Signal.	"	A7	"
5.	"	12MC	(SW) 12MC	"	A8	"
6.	"	10MC	10MC	"	A9	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KF606

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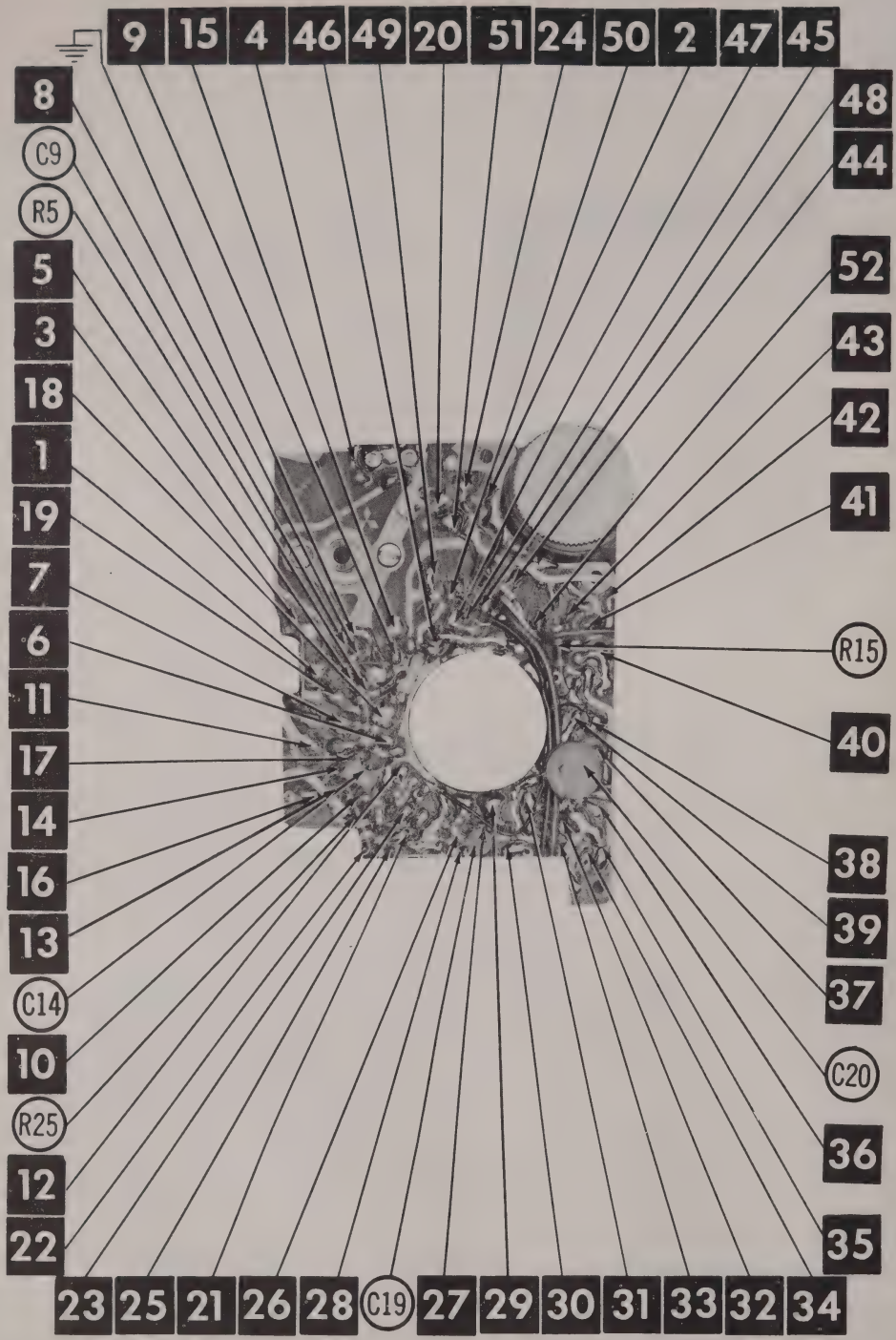
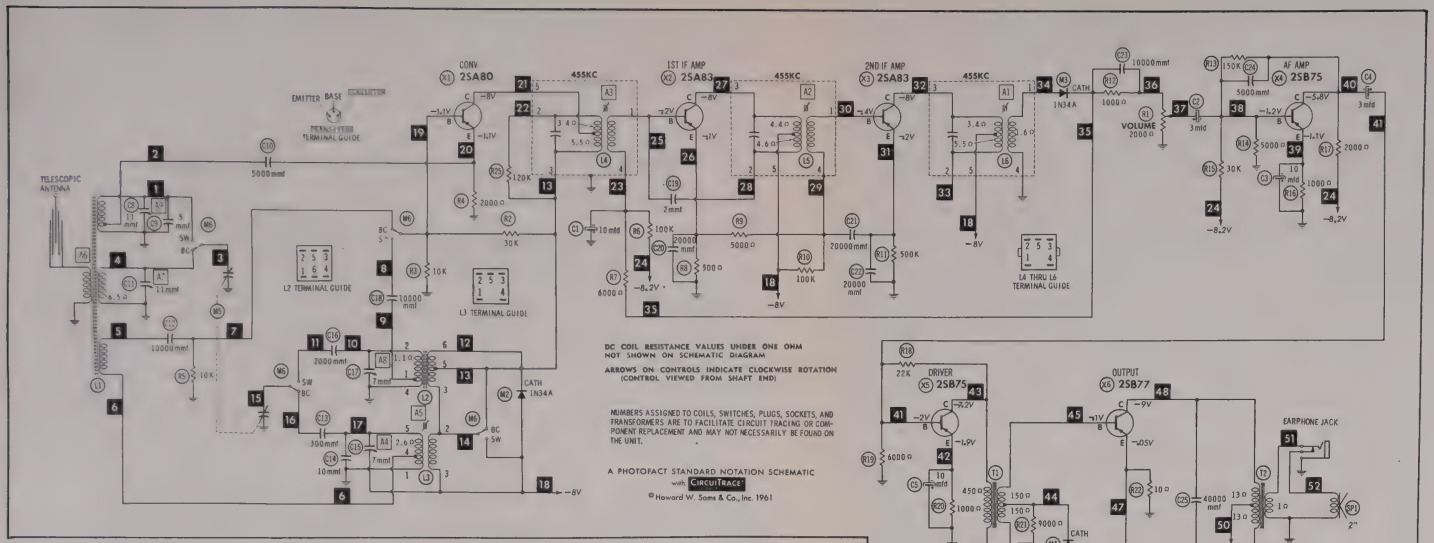
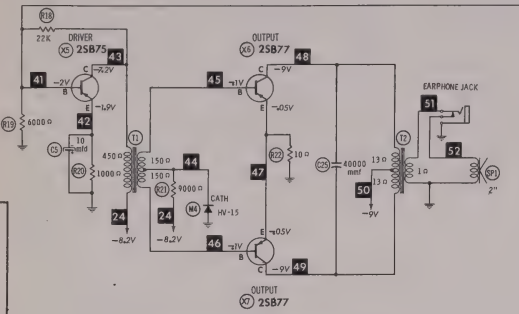
SET 538 FOLDER 6



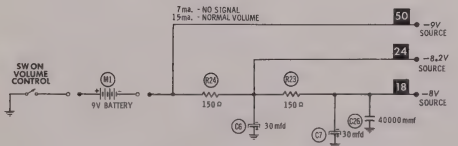
A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

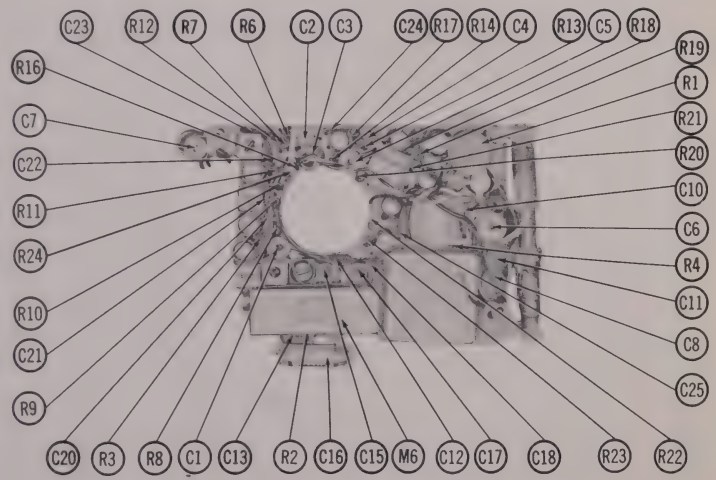

CONV 2SA80
1ST IF AMP 2SA83
2ND IF AMP 2SA83
AF AMP 2SB75
455KC
TELESCOPIC ANTENNA
EMITTER BASE
COLLECTOR
TRANSISTOR TERMINAL GUIDE
L2 TERMINAL GUIDE
L3 TERMINAL GUIDE
L4 THRU L6 TERMINAL GUIDE
VOLUME 2000Ω
CATH 1N34A
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
©Howard W. Sams & Co., Inc. 1961



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.



CHASSIS BOTTOM VIEW-CAPACITOR, RESISTOR & MISC. IDENT.

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2SA80	Converter				PNP
X2	2SA83	1st IF Amp.				PNP
X3	2SA83	2nd IF Amp.				PNP
X4	2SB75	AF Amp.	2N406			PNP
X5	2SB75	Driver	2N406			PNP
X6	2SB77	Output	2N408			PNP
X7	2SB77	Output	2N408			PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Continental PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	10	3			NLW10-6	TT3X10			
C2	3	6			NLW4-15	TT6X3			
C3	10	3			NLW10-6	TT3X10			
C4	3	6			NLW4-15	TT6X3			
C5	10	3			NLW10-6	TT3X10			
C6	30	10			NLW35-12				
C7	30	10			NLW35-12				

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C8	11							
C9	5		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C10	5000		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C11	11							
C12	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C13	300		SI 300	D6-301	L10T3	CCD-301	GP330	10TS-T30
C14	10		SI 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C15	7							
C16	2000		SI 2000	D6-202	BYA10D2	CCD-202	GP220	5HK-D20
C17	7							
C18	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C19	2		NPO-DI 2.2	DTZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C20	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C21	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C22	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C23	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C24	5000		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C25	40000							
C26	40000							

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Continental PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	2000Ω	1/10		B16-212				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	30K				R14	5000Ω			
R3	10K				R15	30K			
R4	2000Ω				R16	1000Ω			
R5	10K				R17	2000Ω			
R6	100K				R18	22K			
R7	6000Ω				R19	6000Ω			
R8	500Ω				R20	1000Ω			
R9	5000Ω				R21	9000Ω			
R10	100K				R22	10Ω			
R11	500Ω				R23	150Ω			
R12	1000Ω				R24	150Ω			
R13	150K				R25	120K			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Continental PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1A	SW Loopstick						
B	BC Loopstick						
L2	SW Osc.						
L3	BC Osc.						
L4	1st IF						
L5	2nd IF						
L6	3rd IF						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Continental PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1, 2	1	PTA-1414					

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Continental PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	550Ω CT	6-8Ω	PTO-1015					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Continental PART No.	QUAM PART No.	
SP1	2"	PM	6-8Ω			

BATTERIES

ITEM No.	VOLTAGE	Continental PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	006P		2U6		216		M-1604	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Continental PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N34A			1N34A	1N34A	Overload Detector
M3	1N34A			1N34A	1N34A	
M4	HV15					Bias Regulator

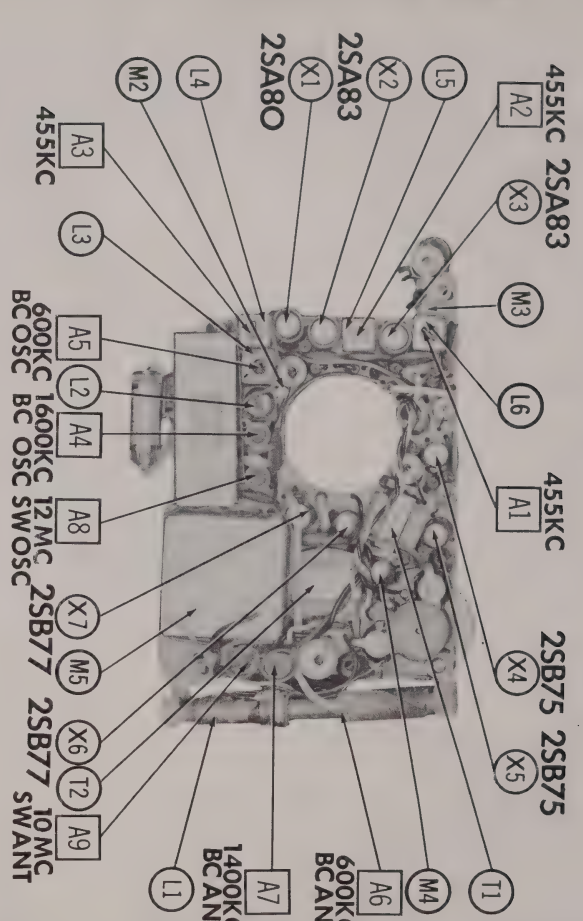
MISCELLANEOUS

ITEM No.	PART NAME	Continental PART No.	NOTES
M5	Tuning Cap.		2 Gang
M6	Switch		Band Selector (Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder

CURTIS MATHES MODELS 2717A, B, 2817A, B (Ch. 17A, B)

CURTIS MATHES MODELS
2717A, B, 2817A, B (Ch. 17A, B)

MODEL 2717A

TRADE NAME	Curtis Mathes Models 2717A, 2817A (Ch. 17A); 2717B, 2817B (Ch. 17B)
MANUFACTURER	Curtis Mathes Mfg. Co., 2220 Young Street, Dallas Texas
TYPE SET	AC Operated 6 Tube AM Receiver With Stereo Amplifier And 4 Speed Automatic Record Changer
POWER SUPPLY	105 – 125 Volts AC, 60 Cycles RATING 29 Watts, .3 Amp. @117 Volts AC (Less Motor)
TUNING RANGE—BROADCAST	540 – 1600KC

FOR SERVICE INFORMATION ON RECORD CHANGER – SEE SIMILAR V-M 1201 – PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

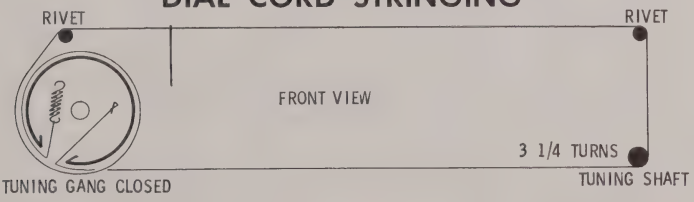
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

Loudness control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A5, A6.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to B-.	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1400KC	1400KC	"	A5	"
3.	Loop	1400KC	1400KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

DIAL CORD STRINGING



CURTIS MATHES MODELS
2717A, B, 2817A, B (Ch. 17A, B)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SET 538 FOLDER 7

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE
V1	Converter	12BE6
V2	IF Amplifier	12BA6
V3	Det.-AVC-Channel 1 AF Amp.	12AV6
V4	Channel 1 Output	35C5 (35L6GT) *
V5	Channel 2 AF Amp.	12AV6
V6	Channel 2 Output	35C5 (35L6GT) *

* Used in some versions.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Curtis Mathes PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■80	150	4A1-A	AFH2-19	XB0181	FP216.2	TMD-2140	TVL-2442.1	①
B	▲50	150							①
C2A	50	150		PRS2240	BBRD8515	TCD498	TDLD-12	TVA-2462	①
B	80	150							①
C3	100	25	4A6	PRS1270	BBR100-25	TC2501	TD-100-25	TVA-1207	①

① In some versions, C1, C2 and C3 are a single 4-section unit (150-80-10mfd@150V and 100mfd@25V) Part #4A8.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C5	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C6	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C7	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C8	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C9	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C10	.01 400V		P488N-01	D6-104	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C11	150	(220) †	DI-150	DD-151	L10T15	CCD-151	B-315	10TS-T15
C12	680 10%		DI-680	DD-681	5R5T68	CCD-681	GP368	10TS-T68
C13	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C15	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C16	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C17	150	(220) †Note 2	DI-150	DD-150	L10T15	CCD-151	B-315	10TS-T15
C18	.022 200V	(.01) †	P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C19	680 10%		DI-680	DD-681	5R5T68	CCD-681	GP368	10TS-T68
C20	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C22	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C23	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

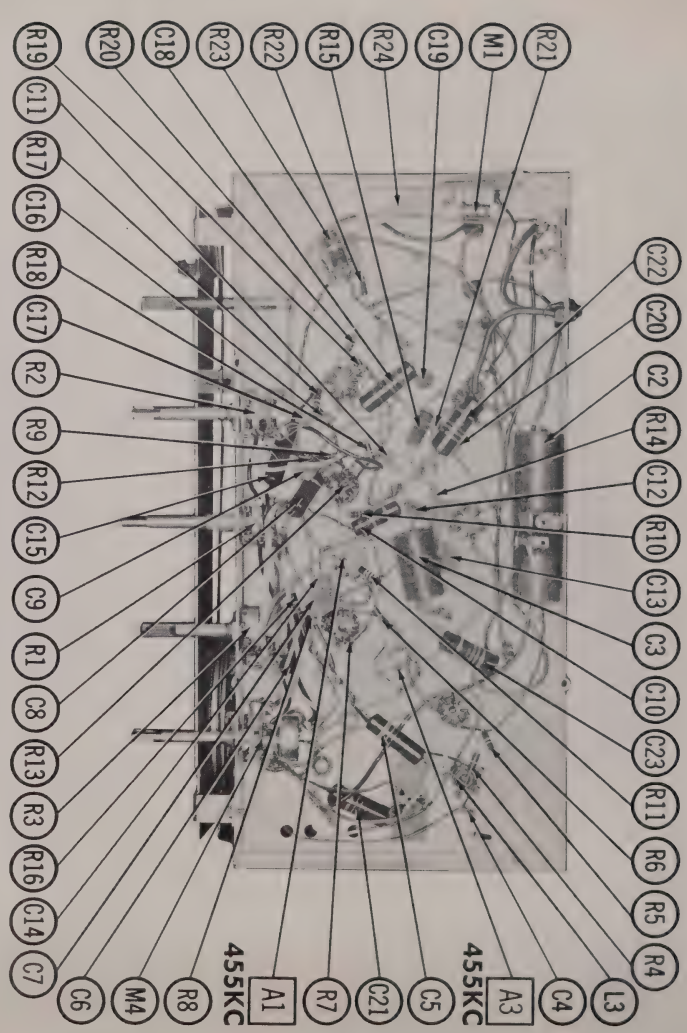
Note 1. Not used in some versions.
† Alternate Value.
Note 2. Not used in Chassis 17B.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Curtis Mathes PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	2A38	F1-59 *				Loudness, Channel 2
	200K Tap							
B	1meg	½		R2-59 *				Loudness, Channel 1
	200K Tap							
R2A	1meg	½	2A19	B-70	AD47-1meg-Z		FA16A	Treble, Channel 1
B	1meg			SR-70	Not Req.		RU16A	Treble, Channel 2
C	Shaft			Not Req.	KSS-3		CS3500	
R3A	3meg	½	2A40	B-85	AD47-3meg-Z		FA36A	Bass, Channel 1
B	3meg			SR-85	Not Req.		RU36A	Bass, Channel 2
C	Shaft			Not Req.	FS-3		CS3500	

* Use AK-32 Friction Drive Spring.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	100Ω				R15	120Ω 2W			
R5	22K				R16	82K			
R6	2.2meg				R17	6.8meg			
R7	68Ω				R18	220K			
R8	82K				R19	470Ω			
R9	6.8meg				R20	68K			
R10	220K				R21	470K			
R11	470K				R22	2200Ω			
R12	470Ω				R23	1000Ω 2W			
R13	56K				R24	5Ω 5W	F-5	7F5	
R14	470K								

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Curtis Mathes PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick	1A6 (Red) ①	BC-419	705-A		T532	① Part #1A35 (Blue) used in later Versions.
L2	Osc.	1A1	BC-381	71-OSC	RTC-8648	T502	
L3	Input IF	1A7	BC-352	12-C1	RTC-8632	T607	
L4	Output IF	1A8	BC-355	12-C6	RTC-8634	T609	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Curtis Mathes PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4400Ω	6-8Ω	10A4B ①	A-2900	A-3850	24S04	S-63X	① Part #10A19-1 used in Chassis 17B ② Part #10A19-2 used in Chassis 17B
T2	4400Ω	6-8Ω	10A4B ②	A-2900	A-3850	24S04	S-63X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Curtis Mathes PART No.	QUAM PART No.	
SP1	8"	PM	6-8Ω	W8CV-12-A	8A21Z6.4	
SP2	8"	PM	6-8Ω	W8CV-12-A	8A21Z6.4	

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Curtis Mathes PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.065A	1N2070	1N1763	2F4	SR-200	Silicon

PHONO CARTRIDGE & NEEDLES

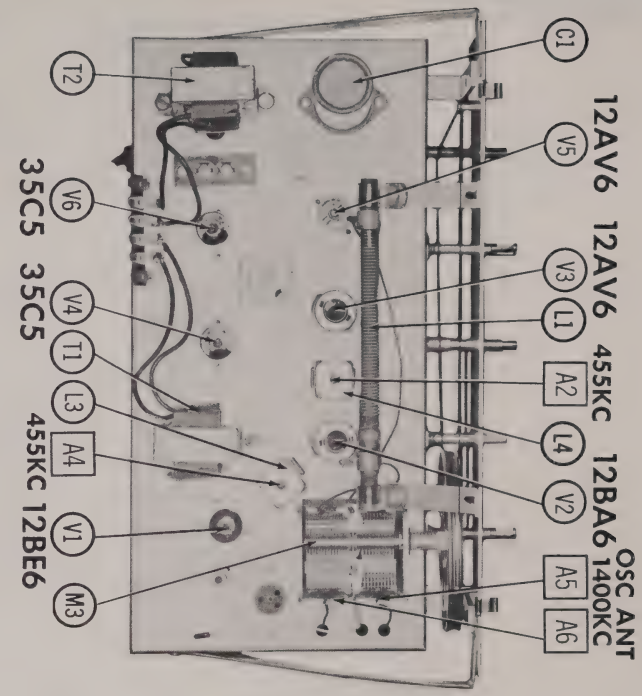
*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	Curtis Mathes PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2			13TB	Not Req.	26S	S1-1 * & S3-3 *	8TA4-S	N-8TA-S *	

MISCELLANEOUS

ITEM No.	PART NAME	Curtis Mathes PART No.	NOTES
M3	Tuning Cap.	3A2	2 Gang (Ant. 35 to 550mmf, Osc. 16 to 117mmf)
	Tuning Cap.	3A10	(Used in Later Versions)
M4	Switch	6A24	Function Selector (Rotary Wafer Type)

CHASSIS—TOP VIEW



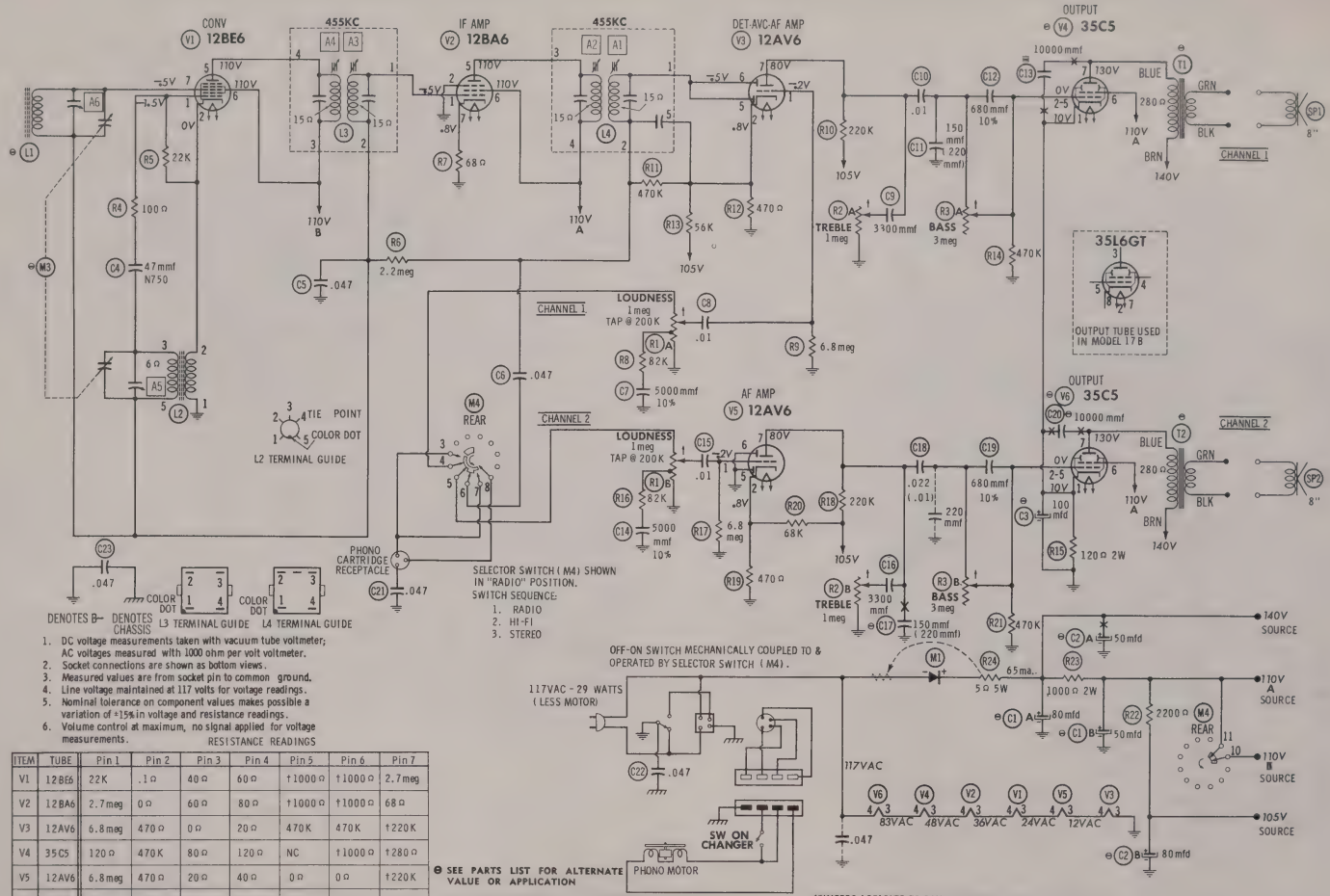
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	2Bi2	
Knob	1iB4	Tuning
Knob	1iB6-3	Level, Rear
Knob	1iB7-3	Level, Front
Knob	1iB3	Tone, Function

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.1Ω	40Ω	60Ω	†1000Ω	†1000Ω	2.7meg
V2	12BA6	2.7meg	0Ω	60Ω	80Ω	†1000Ω	†1000Ω	68Ω
V3	12AV6	6.8meg	470Ω	0Ω	20Ω	470K	470K	†220K
V4	35C5	120Ω	470K	80Ω	120Ω	NC	†1000Ω	†280Ω
V5	12AV6	6.8meg	470Ω	20Ω	40Ω	0Ω	0Ω	†220K
V6	35C5	120Ω	470K	120Ω	160Ω	NC	†1000Ω	†280Ω

† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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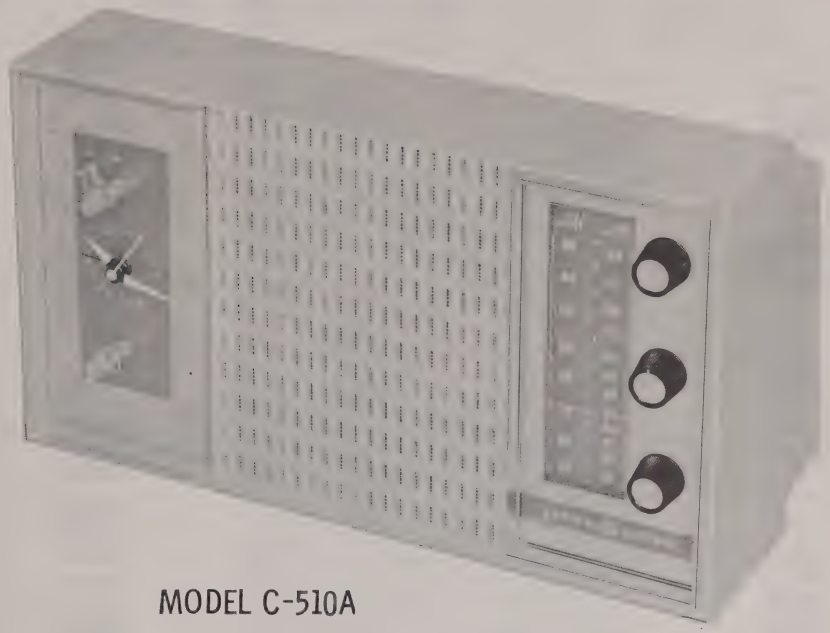
CURTIS MATHES MODELS
2717A, B, 2817A, B (Ch. 17A, B)

PHOTOFACT® Folder with CIRCUITRACE®

GENERAL ELECTRIC MODELS C-510A, T-170A, T-171A

GENERAL ELECTRIC MODELS
C-510A, T-170A, T-171A



MODEL C-510A

GENERAL ELECTRIC MODELS
C-510A, T-170A, T-171A

TRADE NAME	General Electric Models C-510A, T170A, T171A		
MANUFACTURER	General Electric Co., Product Service, Radio Receiver Dept., 1001 Broad Street, Utica, N. Y.		
TYPE SET	AC Operated 7 Tube FM-AM Receiver With Electric Clock (Models T-170A, T-171A Do Not Include Clock)		
POWER SUPPLY	105 — 120 Volts AC, 60 Cycles	RATING	28 Watts, .28 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540 — 1600KC	FREQ. MOD.	88 — 108MC

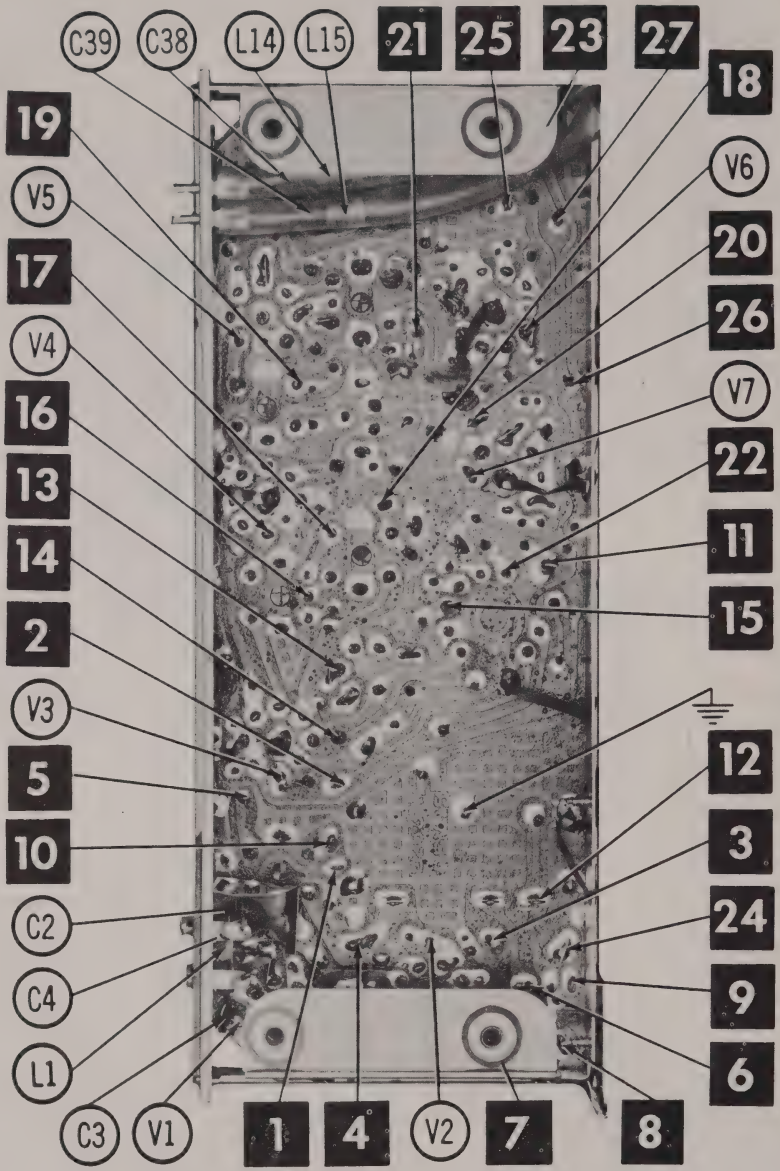
DISASSEMBLY

1. Remove 3 knobs.
2. Remove 2 screws in recessed hand grip and 2 screws at bottom edge of cabinet back.
3. Remove 4 screws from cabinet bottom.
4. Remove 5 screws holding dial plate to cabinet front.
5. Remove screw holding band switch arm to cabinet front.
6. Remove Chassis.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KK614

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



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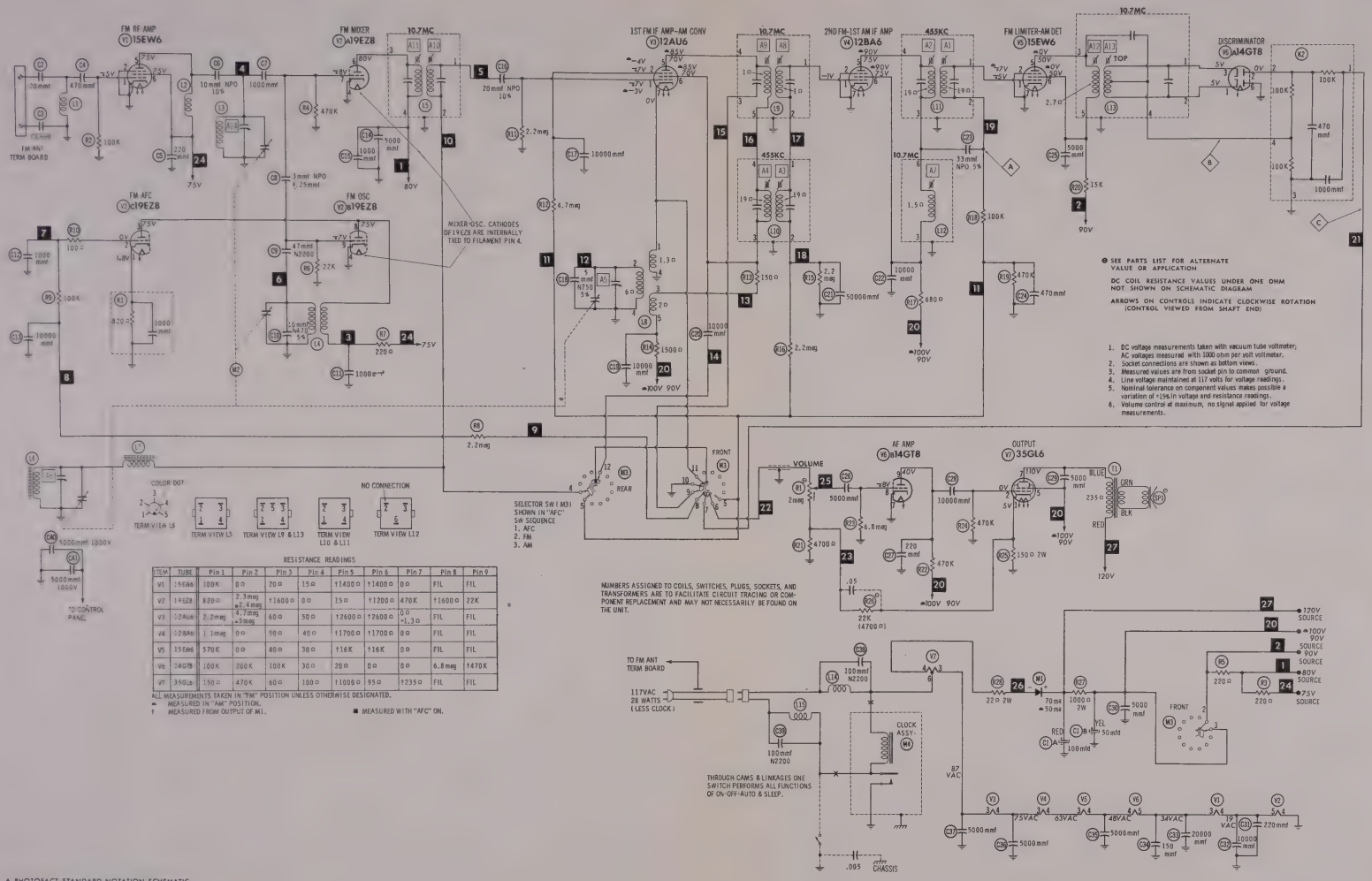
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED


FM RF AMP V1 15EW6
FM MIXER V2 a19EZ8
10.7MC
1ST FM IF AMP-AM CONV V3 12AU6
10.7MC
2ND FM-1ST AM IF AMP V4 12BA6
455KC
FM LIMITER-AM DET V5 15EW6
10.7MC
DISCRIMINATOR V6 a14GT8
FM AFC V7 c19EZ8
FM OSC V8 a19EZ8
MIXER-OSC. CATHODES OF 19EZ8 ARE INTERNALLY TIED TO FILAMENT PIN 4.
455KC
10.7MC
AF AMP V6 a14GT8
OUTPUT V7 35GL6
VOLUME
FRONT
REAR
SELECTOR SW (M3) SHOWN IN "AFC" SW SEQUENCE
1. AFC
2. FM
3. AM
COLOR DOT
NO CONNECTION
TERM VIEW L8
TERM VIEW L5
TERM VIEW L9 & L13
TERM VIEW L10 & L11
TERM VIEW L12
TO CONTROL PANEL
TO FM ANT TERM BOARD
117VAC 28 WATTS (LESS CLOCK)
CLOCK ASSY. M4
THROUGH CAMS & LINKAGES ONE SWITCH PERFORMS ALL FUNCTIONS OF ON-OFF-AUTO & SLEEP.
CHASSIS
120V SOURCE
100V 90V SOURCE
90V SOURCE
80V SOURCE
75V SOURCE
87 VAC
75VAC
63VAC
48VAC
34VAC
19 VAC
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

TSW	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	15EW6	100K	0Ω	20Ω	15Ω	↑1400Ω	↑1400Ω	0Ω	FIL	FIL
V2	19EZ8	820Ω	2.3meg ■2.4meg	↑1600Ω	0Ω	15Ω	↑1200Ω	470K	↑1600Ω	22K
V3	12AU6	2.2meg	4.7meg ■5meg	60Ω	50Ω	↑2600Ω	↑2600Ω	0Ω ■1.3Ω	FIL	FIL
V4	12BA6	1.1meg	0Ω	50Ω	40Ω	↑1700Ω	↑1700Ω	0Ω	FIL	FIL
V5	15EW6	570K	0Ω	40Ω	30Ω	↑16K	↑16K	0Ω	FIL	FIL
V6	14GT8	100K	200K	100K	30Ω	20Ω	0Ω	0Ω	6.8meg	↑470K
V7	35GL6	150Ω	470K	60Ω	100Ω	↑1000Ω	95Ω	↑235Ω	FIL	FIL

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
▬ MEASURED IN "AM" POSITION.
↑ MEASURED FROM OUTPUT OF M1.
■ MEASURED WITH "AFC" ON.

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with CIRCUITRACE

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GENERAL ELECTRIC MODELS C-510A, T-170A, T-171A

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A4.....	GENERAL CEMENT #8282, 8606, 8606-L, 9091 WALSCO #2526, 2541, 2542, 2543, 2544
A5, A6, A14.....	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A7 thru A13.....	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989 WALSCO #2515, 2531, 2532

AM ALIGNMENT – SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 1 (grid) of AM Converter. Low side to chassis.	455KC (400∿ 30% AM)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1500KC	1500KC Signal.	"	A6	Adjust for maximum output. Repeat Steps 1, 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM – SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A7, A8, A9, A10, A11	Adjust for maximum deflection.
5.	High side thru .01mfd to pin 1 (grid) of FM Limiter. Low side to chassis.	"	"	DC probe thru 1meg to point Ⓑ. Common to chassis.	A12	"
6.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE – SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .01mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A7, A8, A9, A10, A11	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
5.	High side thru .01mfd to pin 1 (grid) of FM Limiter. Low side to chassis.	"	"	Vert. amp. thru 47K to point Ⓑ. Low side to chassis.	A12	"
6.	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A13	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A12 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT – SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Across FM antenna terminals with 120Ω in each lead.	98MC (Unmod.)	(FM) 98MC	DC probe to point Ⓐ. Common to chassis.	L4	Adjust for maximum deflection by expanding or compressing coil turns.
8.	"	108MC	108MC	"	A14	Adjust for maximum deflection.

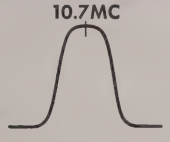


FIG. 1

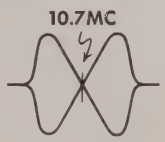
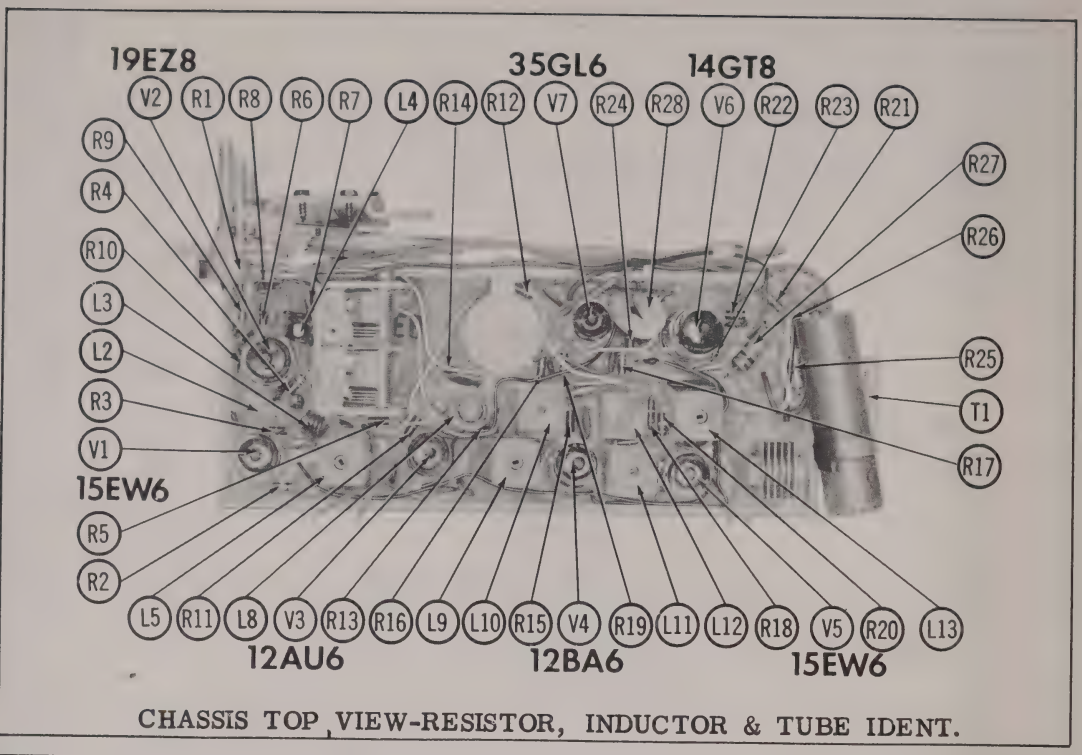
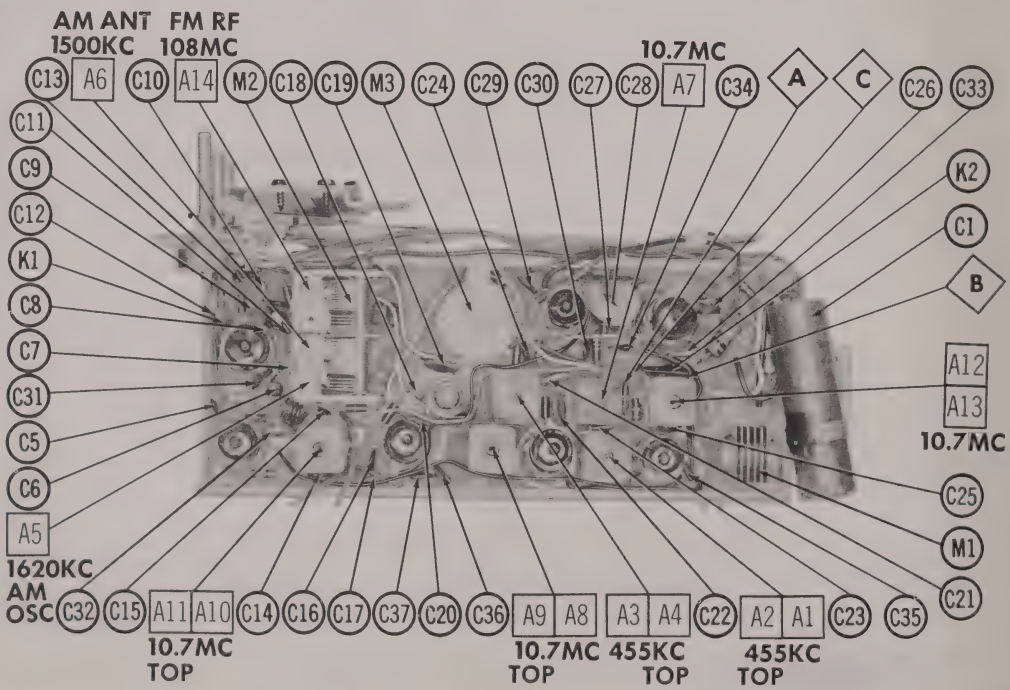


FIG. 2



CHASSIS TOP VIEW-RESISTOR, INDUCTOR & TUBE IDENT.



CHASSIS TOP VIEW-ALIGNMENT, CAPACITOR & MISC. IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	FM RF Amp.	15EW6
V2	FM Mixer-FM Osc.-AFC	19EZ8
V3	1st FM IF Amp. -AM Conv.	12AU6
V4	2nd FM-1st AM IF Amp.	12BA6
V5	FM Limiter-AM Det.	15EW6
V6	Disc. - AF Amp.	14GT8
V7	Output	35GL6

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G.E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg	½	RS-3073①	B-76	A47-2meg-Z	Q13-139	U55	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

① Models T-170A, T171A use Part #RS-2066.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	G.E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	100	150	RS-2617	PRS2240	BBRD0183.7	WD235	TDLD-14	TVAS-2463 *	
B	50	150							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	20		DI-20	DD-200	L10Q2	CCD-200	GP420	10TS-Q20
C3	20		DI-20	DD-200	L10Q2	CCD-200	GP420	10TS-Q20
C4	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C5	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C6	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C7	1000		BPD-01	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C8	3 NPO ± .25mmf		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C9	47	#RS-1785				*		
C10	10 N470 5%					*		
C11	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C12	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C15	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C16	20 NPO 10%		NPO-DI 20	DTZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	5 N750 5%			DTN-5	C10V5U	CCTN-050	CN7-550	10TCU-V50
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	50000		BPD-05	DD-150	H-05S5	IDP-2-503	GP150	5HK-S50
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	33 NPO 5%			DTZ-33	C10Q33C		CNO-433	10TCC-Q33
C24	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C25	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C26	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C27	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C29	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C30	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C31	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C34	150		DI-150	DD-151	L10T15	CCD-150	B-315	10TS-T15
C35	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C36	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C37	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C38	100 N2200					*		
C39	100 N2200					*		
C40	5000 1000V		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C41	5000 1000V		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50

\# General Electric Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	100K				R16	2.2meg			
R3	220Ω				R17	680Ω			
R4	470K				R18	100K			
R5	220Ω				R19	470K			
R6	22K				R20	15K			
R7	220Ω				R21	4700Ω			
R8	2.2meg				R22	470K			
R9	100K				R23	6.8meg			
R10	100Ω				R24	470K			
R11	2.2meg				R25	150Ω 2W			
R12	4.7meg				R26	22K			(4700Ω) *
R13	150Ω				R27	1000Ω 2W			
R14	1500Ω				R28	22Ω 2W			
R15	2.2meg								

* Used in Model C-510A.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	G.E. PART No.	REPLACEMENT DATA
K1	AFC Cathode	1000mmf, 820Ω	RS-1819	
K2	Discriminator Network	470mmf, 1000mmf, (3) 100K	RS-1316	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		G.E. PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	FM Ant.	RS-2810					
L2	RF Choke (1.5uh)	RS-1292	BC-562	4604	RTC-8516	T856	
L3	FM RF	RS-2811					
L4	FM Osc.	RS-2812					
L5	1st FM IF	RS-2805	FM-256	1463-PC	RTC-9046	T654	
L6	Loopstick	RS-2841	BC-419	705-A		T532	
L7	RF Choke (3.9uh)	RS-2842	BC-564	4608	RTC-8518	T858	
L8	AM Osc.	RS-2813					
L9	2nd FM IF	RS-2806					
L10	1st AM IF	RS-2807	BC-356	13-PC1	RTC-8641	T614	
L11	2nd AM IF	RS-2807	BC-357	13-PC2	RTC-8642	T615	
L12	3rd FM IF	RS-1527					
L13	Discriminator	RS-2808					
L14	Line Choke	RS-1328					
L15	Line Choke	RS-1328					

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	G. E. PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1900Ω	2-4Ω	RS-2840	A-3025	A-3332	24S53	S-20X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	G. E. PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	RB-1204	4A05	Model C-510A
	5 1/4"	PM	3-4Ω	RB-1186	52A1	Models T170A, T171A

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	G. E. PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.070A	RS-1319 ♦	1N1763 *	100 ♦	SR200 *	* Silicon ♦ Selenium

MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M2	Tuning Cap.	RS-2838	4 Gang
M3	Switch	RS-2803	Band Selector
M4	Clock Ass'y.		Telechron #J3G4
	Clock Hands	RS-3074	1 each of Hour, Minute, Second and Alarm

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

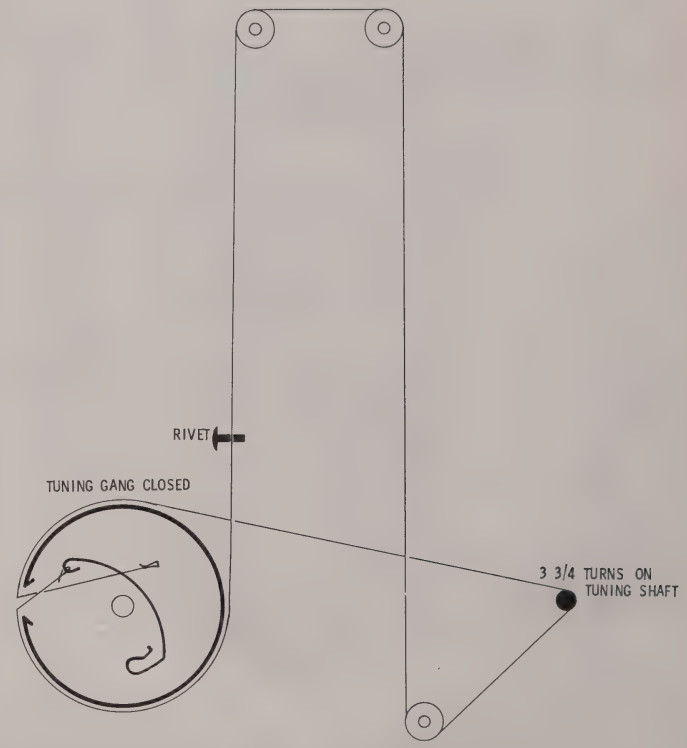
NAME	PART NO.	DESCRIPTION
Crystal	RS-3069	Clock, Model C-510A
Dial Scale	RS-3067	Model C-510A
Dial Scale	RS-2819	Model T-170A
Dial Pointer	RS-2826	
Knob	RS-2820	Tuning, Volume
Knob	RS-2821	Band Selector
Knob	RS-2200	Clock
Cabinet Front	RB-1187	Model T-170A
Cabinet Front	RB-1202	Models T-171A, C-510A
Cabinet Back	RB-1203	Model T-171A, C-510A
Cabinet Back	RB-1188	Model T-170A

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

DIAL CORD STRINGING



PHOTOFACT® Folder

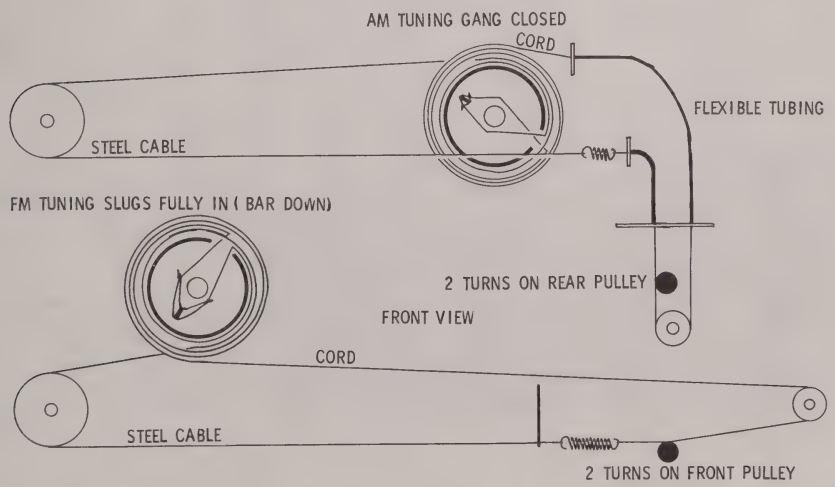
NORELCO
MODEL B3X98A

NORELCO
MODEL B3X98A

TRADE NAME	Norelco Model B3X98A			
SUPPLIER	North American Philips Co., Inc., 100 E. 42nd Street, New York 17, N. Y.			
TYPE SET	AC Operated 7 Tube FM-BC-SW Receiver			
POWER SUPPLY	90/110/127/145/190/220 Volts AC, 60 Cycles			
RATING	37 Watts, .35 Amp. @ 117 Volts AC (On 127 Volt Tap)			
TUNING RANGES	BROADCAST FREQ. MOD.	517—1620KC 88—108MC	SHORT WAVE 1 SHORT WAVE 2	5.88—18.2MC 1.6—5.89MC

NORELCO
MODEL B3X98A

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KK555

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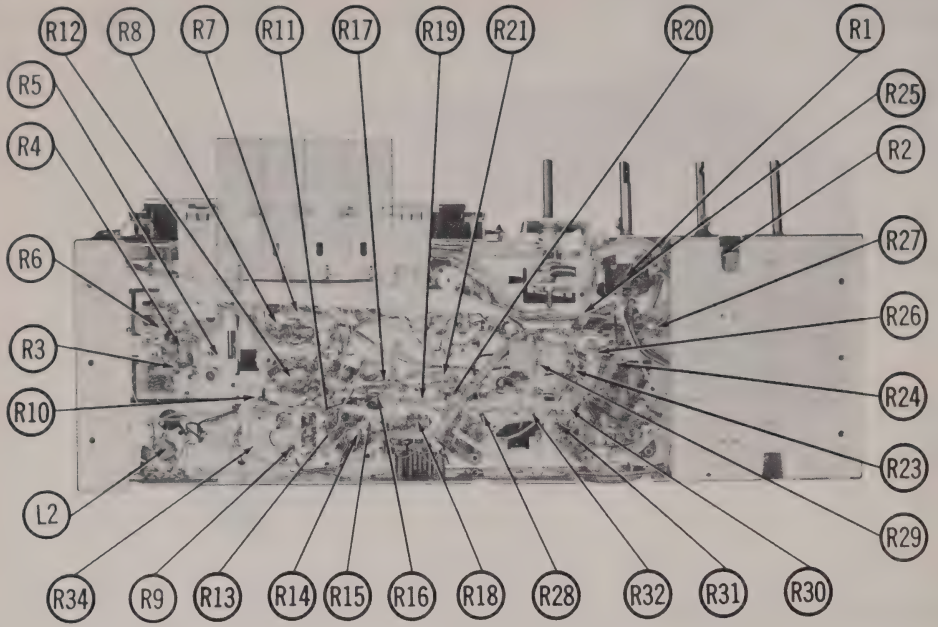
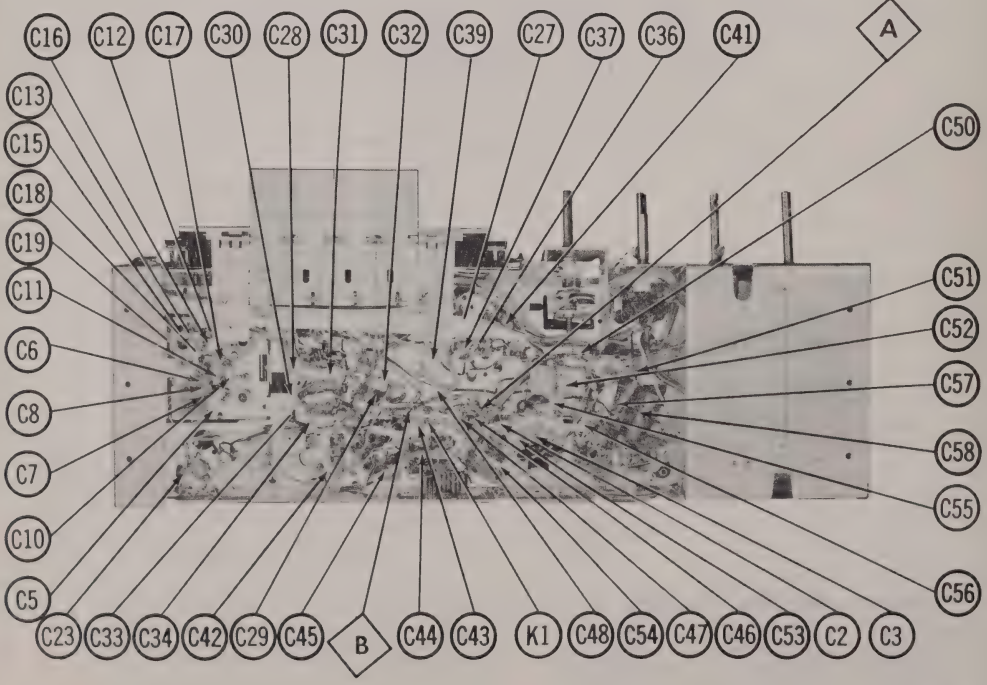
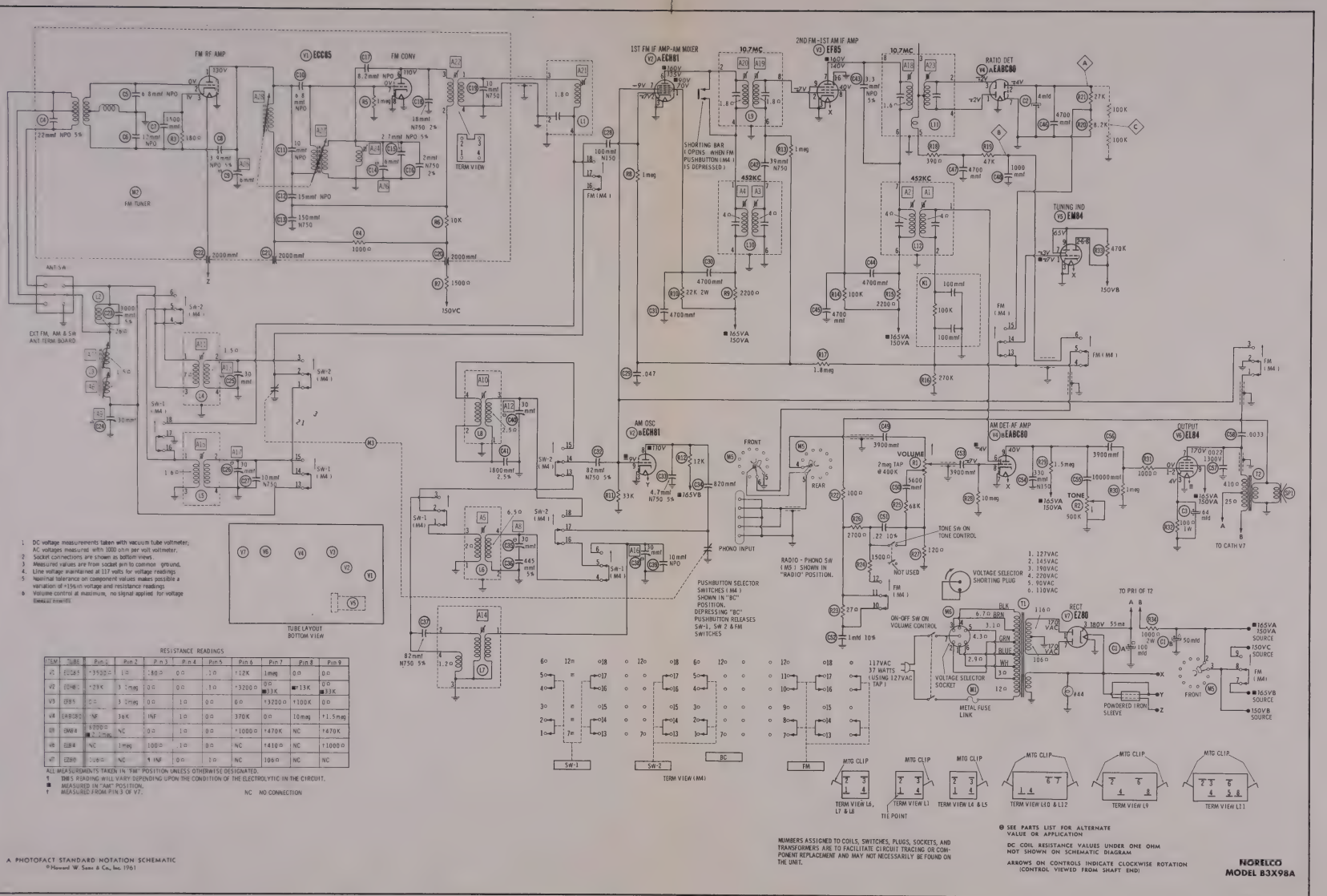


CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.



CHASSIS BOTTOM VIEW-ALIGNMENT, CAPACITOR & MISC. IDENT.



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

1. 127VAC
2. 145VAC
3. 190VAC
4. 220VAC
5. 90VAC
6. 110VAC

117VAC 37 WATTS (USING 127VAC TAP)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	†3500Ω	1Ω	1.8Ω	0Ω	1Ω	†12K	1meg	0Ω	0Ω
V2	ECH81	†23K	3.3meg	0Ω	0Ω	1Ω	†3200Ω	0Ω ■33K	■13K	0Ω ■33K
V3	EF85	0Ω	3.2meg	0Ω	1Ω	0Ω	0Ω	†3200Ω	†100K	0Ω
V4	EABC80	INF	36K	INF	1Ω	0Ω	370K	0Ω	10meg	†1.5meg
V5	EM84	†4000Ω ■2.2meg	INF	0Ω	1Ω	0Ω	†1000Ω	†470K	NC	†470K
V6	EL84	NC	1meg	100Ω	1Ω	0Ω	NC	†410Ω	NC	†1000Ω
V7	EZ80	106Ω	NC	¶ INF	0Ω	1Ω	NC	106Ω	NC	NC

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
■ MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 3 OF V7.
NC NO CONNECTION

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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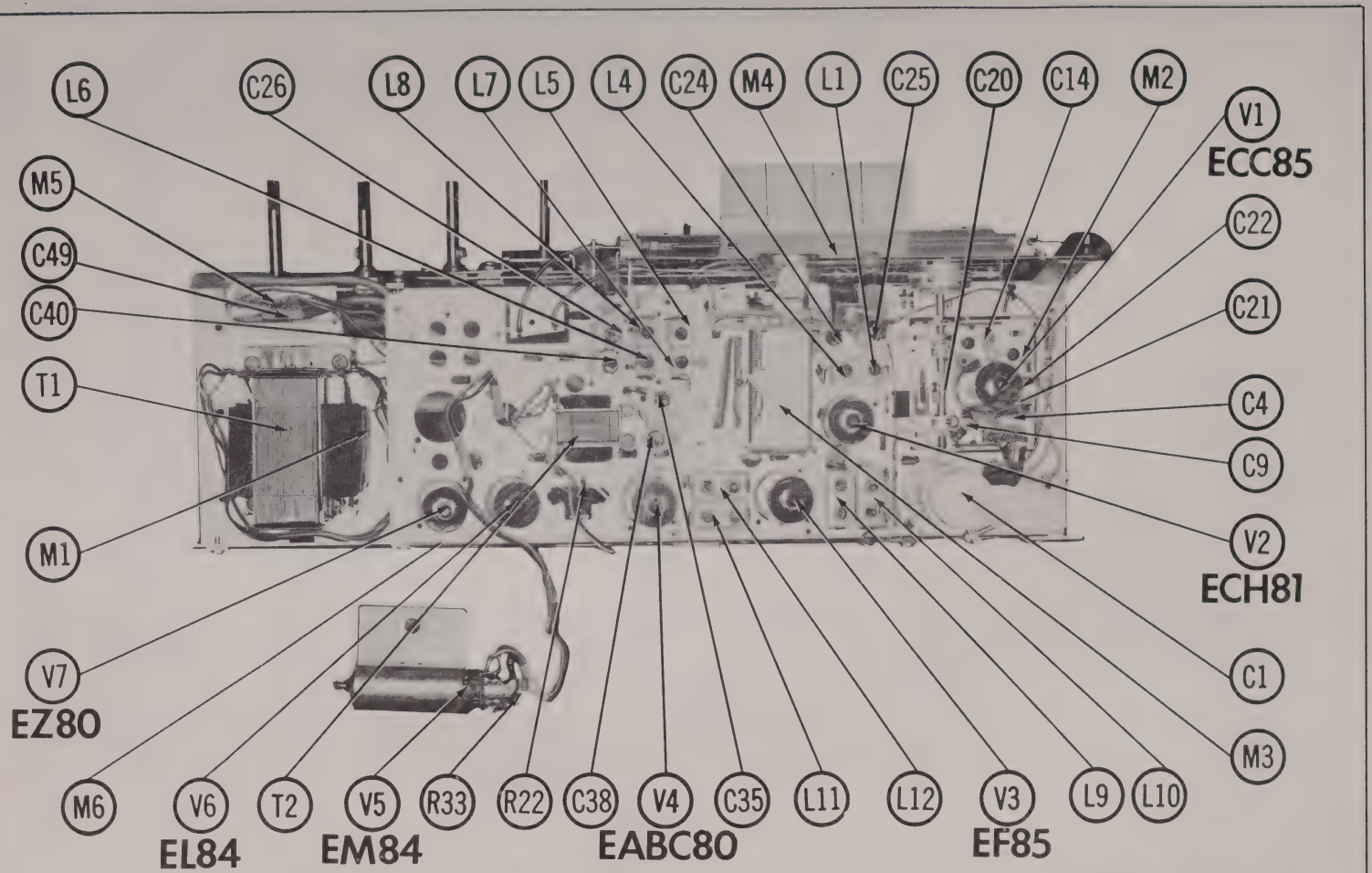
NORELCO MODEL B3X98A



CHASSIS TOP VIEW-CAPACITOR, INDUCTOR, MISC. & TUBE IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A4.....	GENERAL CEMENT #8721, 8722 WALSCO #2519
A5, A10, A11, A14, A15, A18, A19, A20, A21, A22, A23, A24.....	GENERAL CEMENT #8282, 8606, 8606-L, 9091 WALSCO #2526, 2541, 2542, 2543, 2544
A25, A26.....	GENERAL CEMENT #5003, 8271, 8275, 8276, 8609, 8721, 8722, 9150, 9298 WALSCO #2516, 2518, 2519

AM ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to pin 2 (grid) of AM Converter. Low side to chassis.	452KC (400% Mod.)	(BC) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	550KC	550KC	"	A5, A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1500KC	1500KC	"	A8, A9	"
4.	"	1.72MC	(SW2) 1.72MC	"	A10, A11	"
5.	"	5.4MC	5.4MC	"	A12, A13	"
6.	"	6.3MC	(SW1) 6.3MC	"	A14, A15	"
7.	"	17.1MC	17.1MC	"	A16, A17	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

Connect two matched 100K (± 1%) resistors in series from point ◇A◇ to chassis. The junction of these two resistors is alignment point ◇C◇ as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Across FM antenna terminals.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point ◇A◇. Common to chassis.	A18, A19, A20, A21, A22	Adjust for maximum deflection.
9.	"	"	"	DC probe to point ◇B◇. Common to point ◇C◇.	A23	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
8.	Across FM antenna terminals.	10.7MC (450KC Swp.)	(FM) Point of non-interference.	Vert. amp. to point ◇A◇. Low side to chassis.	A18, A19, A20, A21, A22	Disconnect stabilizing Capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
9.	"	"	"	Vert. amp. to point ◇B◇. Low side to chassis.	A23	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT – SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	Across FM antenna terminals.	87.5MC	(FM) Low freq. stop.	DC probe to point ◇A◇. Common to chassis.	A24, A25	Adjust for maximum deflection.
11.	"	108MC	108MC	"	A26	"
12.	"	100MC	100MC	"	A27, A28	"

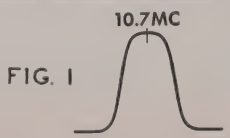


FIG. 1

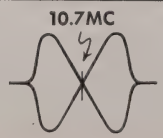


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp.-FM Conv.	ECC85	V5	Tuning Indicator	EM84
V2	1st FM IF Amp.-AM Osc.	ECH81	V6	Output	EL84
V3	2nd FM-1st AM IF Amp.	EF85	V7	Rectifier	EZ80
V4	Ratio Detector-AM Det.-AF Amp.	EABC80			

ELECTROLYTIC CAPACITORS

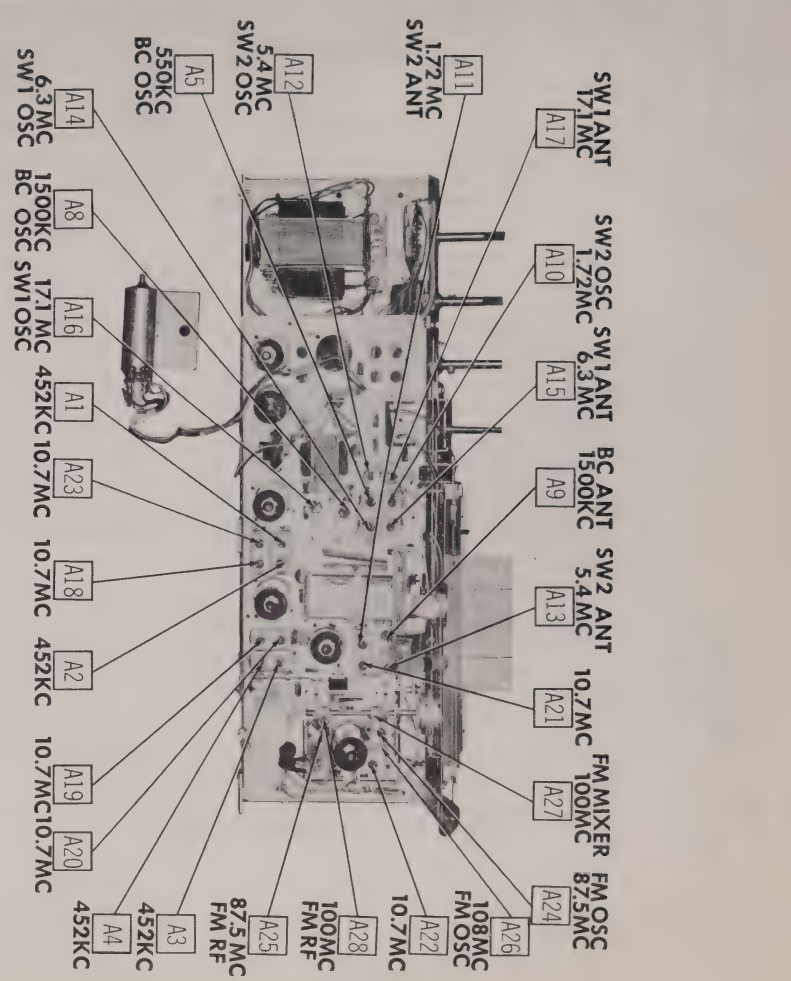
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA NORELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■100	250	AC5306/100+50		XA0312	FP129.1	TMS-1550	TVL-1535	
B	▲50	250			BR5025	TC59	TD-50-450	TVA-1512	
C2	4	64	C425AL/H4	PRS1400	NLW4-150	TT150X4	MLV5-100	TE-1403	
C3	64	10	C426AE/D64	PRS1490	NLW75-10	TT10X60	MLV50-15	TE-1134	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	22 NPO 5%			TCZ-22	C10Q22C	CM-15C-220J	CNO-422	10TCC-Q22
C5	6.8 NPO		NPO-SI 6.8	TCZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C6	12 NPO			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C7	1500		SI 1500	D6-152	BYA10D15	CCD-152	B-215	5HK-D15
C8	3.9 NPO 5%				C10V4C			10TCC-V39
C9	6	Note 1						
C10	6.8 NPO		NPO-SI 6.8	TCZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C11	10 NPO		NPO-SI 10	TCZ-10	C10Q10	CCTO-100	CNO-410	10TCC-Q10
C12	15 NPO 5%			TCZ-15	C10Q15C	CM-15C-150J	CNO-415	10TCC-Q15
C13	150 N750		N750-SI 150	TCN-150	C10T15U	CCTN-151	CN7-315	10TCU-T15
C14	6	Note 1						
C15	2.7 NPO 5%							10TCC-V27
C16	2 N750 2%						CN7-522	
C17	8.2 NPO		NPO-SI 8.2		C10V82C			10TCC-V82
C18	18 N750 2%			TCN-18				
C19	10 N750		N750-SI 10	TCN-10		CCTN-100	CN7-410	10TCU-Q10
C20	2000							
C21	2000							
C22	2000							
C23	3000 5%				1R5D3	CM-20B-302J	MCE461	MS-23
C24	30	Note 1						
C25	30	Note 1						
C26	30	Note 1						
C27	10 N750		N750-SI 10	TCN-10	C10Q1C	CCTN-100	CN7-410	10TCU-Q10
C28	100 N150					CCTN-101		10TCN-T10
C29	.047 125		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C30	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C31	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C32	82 N750 5%		N750-SI 82	TCN-82	C10Q82U		CN7-482	10TCU-Q82
C33	4.7 N750 5%		N750-SI 5.0	TCN-4R7	C10V5C	CCTN-050	CN7-547	10TCU-V50
C34	820		SI 820	D6-821	BYA10T82	CCD-821	B-382	10TS-T82
C35	30	Note 1						
C36	445 5%							
C37	82 N750 5%			TCN-82	C10Q82U		CN7-482	10TCU-Q82
C38	30	Note 1						
C39	10 NPO		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C40	30	Note 1						
C41	1800 2.5%					CM-20E-182G	MCE456.5	
C42	39 N750		N750-SI 39	TCN-39	C10Q39U	CCTN-390	CN7-439	10TCU-Q39
C43	3.3 NPO 5%		NPO-SI 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C44	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C45	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C46	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C47	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C48	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C49	3900		SI 4000	D6-402	Li0D39	CCD-392	GP239	10TS-D 39
C50	5600		SI 5600	D6-562	DPMS6D56	CCD-562	B-256	10TS-D56
C51	.22 125V 10%		V84C2P22-10%		PM2P22	2DP-4-224	GEM-2022	2TM-P22
C52	1mfd 125V 10%				PM2W1		GEM-21	2TM-M1
C53	3900		SI 4000	D6-402	Li0D39	CCD-392	GP239	10TS-D39
C54	330 N150					*		
C55	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-S10
C56	3900		SI 4000	D6-402	Li0D39	CCD-392	GP239	10TS-D39
C57	.0022 1300V				CUBi6D22	16DP-2-222	GEM-1622	MB-D22
C58	.0033 200V		P288N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33

Note 1. Nominal Value.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	NORELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg 400K Tap	½	E098AL/00B20					Volume
B	Switch							Power Off-On
R2A	500K	½	E098AL/00B13					Tone
B	Switch							Tone Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	180Ω				R19	47K			
R4	1000Ω				R20	8200Ω			
R5	1meg				R21	27K			
R6	10K				R22	100Ω			
R7	1500Ω				R23	27Ω			
R8	1meg				R24	1500Ω			
R9	2200Ω				R25	68K			
R10	22K 2W				R26	2700Ω			
R11	33K				R27	120Ω			
R12	12K				R28	10meg			
R13	1meg				R29	1.5meg			
R14	100K				R30	1meg			
R15	2200Ω				R31	1000Ω			
R16	270K				R32	100Ω 1W			
R17	1.8meg				R33	470K			
R18	390Ω				R34	1000Ω 2W			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		NORELCO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	2nd FM IF	A312783					
L2	RF Choke	A380361					
L3	Loopstick	922/01	BC-419	705-A		T532	
L4	SW2 Ant.	921/60-187M					
L5	SW 1 Ant.	921/16-50M					
L6	BC Osc.	923/U185-590M					
L7	SW 1 Osc.	923/16-50M					
L8	SW 2 Osc.	923/60-187M					
L9	3rd FM IF	926/10.7					
L10	1st AM IF	925/452-2					
L11	Ratio Detector	926/10.7RD-2					
L12	2nd AM IF	925/452-2					

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.		SEC.	NORELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	220V Tap ⓐ 190V, 145V, 127V, 110V, 90V 117V ⓐ. 35A (on 127V Tap)		340VCT ⓐ. 055A	A314337					
	SEC. 2								
	6.3V ⓐ 3.2A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	NORELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	3700Ω Tap ⓐ 6%	3-4Ω	A315410					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	NORELCO PART No.	QUAM PART No.	
SP1	4"x 6"	PM	3-4Ω	AD2460M	46A1	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	NORELCO PART No.	REPLACEMENT DATA
K1	AM Diode RF Filter	100mmf, 100mmf, 100K		Aerovox PA-655 Centralab PC-326 Sprague D-4

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			NORELCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	Metal Fuse Link							

MISCELLANEOUS

ITEM No.	PART NAME	NORELCO PART No.	NOTES
M2	FM Tuner	A341813	Complete
M3	Tuning Cap.	4900194	2 Gang.
M4	Switch		Function Selector, Pushbutton Type (Includes FM, MW, SW3, & SW2
M5	Switch		Phono (Rotary Type)
M6	Switch		Input Voltage Selector

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Window	A383035	Tuning Indicator
Dial	A393806	USA
Dial	A393796	Canada
Knob	A378231	Tuning
Knob	A378380	Phono Switch
Pushbutton	P542042/423/FY	

WIRING DATA

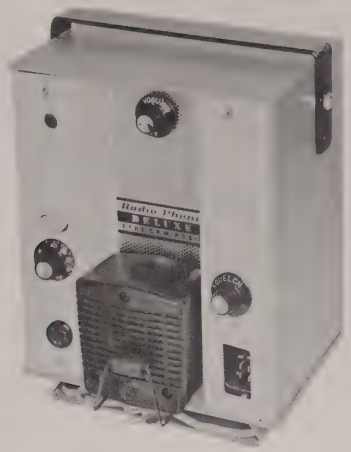
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8534 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

RCA MODEL CRM-P2B-5
(MI-555528, MI-555529)

RCA MODEL CRM-P2B-5
(MI-555528, MI-555529)



TRADE NAME	RCA Model CRM-P2B-5 (MI-555528, 6 Volt) (MI-555529, 12 Volt)
MANUFACTURER	Radio Corp. of America, Communication Products Dept., Radiomarine Marketing, Camden, N. J.
TYPE SET	AC - Battery Operated 7 Tube Crystal Controlled Citizens Band Transmitter-Receiver
POWER SUPPLY	110 — 120 Volts AC, 60 Cycles (or) 12 Volt Storage Battery (some versions operate on 110-120 volts AC, 60 cycles (or) 6 volt storage battery)
RATING	52 Watts, .5 Amp. @117 Volts AC (or) 3.2 Amp. @12.6 Volts DC
FREQ. RANGE	Any one of Citizens Band Channels 1 thru 23 (Receiver is tunable if crystal is removed)

NOTICE

ONLY THOSE PERSONS PROPERLY LICENSED BY FCC ARE PERMITTED TO MAKE CRYSTAL SUBSTITUTION OR EFFECT REPAIRS ON THE TRANSMITTER PORTION OF THIS UNIT.

ALIGNMENT INSTRUCTIONS

RECEIVER

Turn squelch control to maximum counter-clockwise position.

1. Connect DC probe of VTVM to point Ⓐ, common to chassis.

   Connect high side of Signal Generator (1650KC, 400∿ Mod.) thru .001mfd to pin 7 of V2, low side to chassis. Adjust A1, A2, A3, A4, A5 and A6 for maximum deflection.

2. Connect high side of Signal Generator to antenna socket, low side to chassis. Adjust for proper channel frequency (400∿ Mod.). Adjust A7 for maximum deflection.

   Remove receiver oscillator crystal.

3. Set Signal Generator to channel 1 (26.965mc). Set tuning capacitor (M7) for maximum capacitance. Adjust A8 for maximum deflection. Check to see if the tuning range covers all 22 channels, if not, make compromise adjustment of A8.

TRANSMITTER

1. Connect DC probe of VTVM through 100K to point Ⓑ, low side to chassis. With the antenna disconnected, adjust A9 for maximum deflection.

   Adjust A10 for minimum plate current.

   Adjust A11 to approximately 3/4 of maximum capacity.

   The voltage at point Ⓑ should be noted when A10 is tuned through resonance. Adjust A12 for minimum variation in grid voltage with the tuning of A10. When properly neutralized, the variation should not cause the grid voltage to be less than -5 volts.

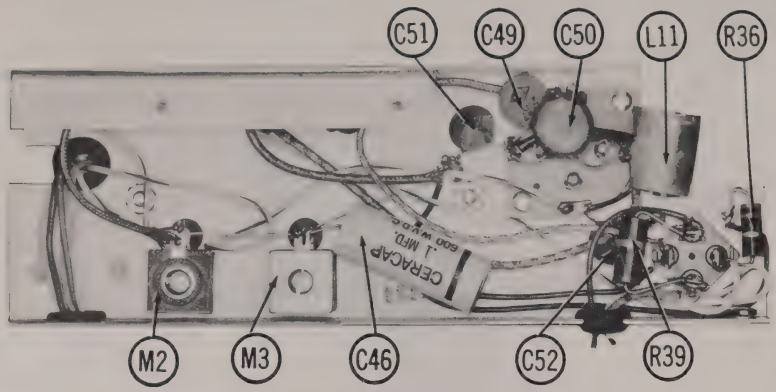
   Connect antenna, readjust A10 for minimum plate current. Readjust A9 to set transmitter exactly on frequency.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

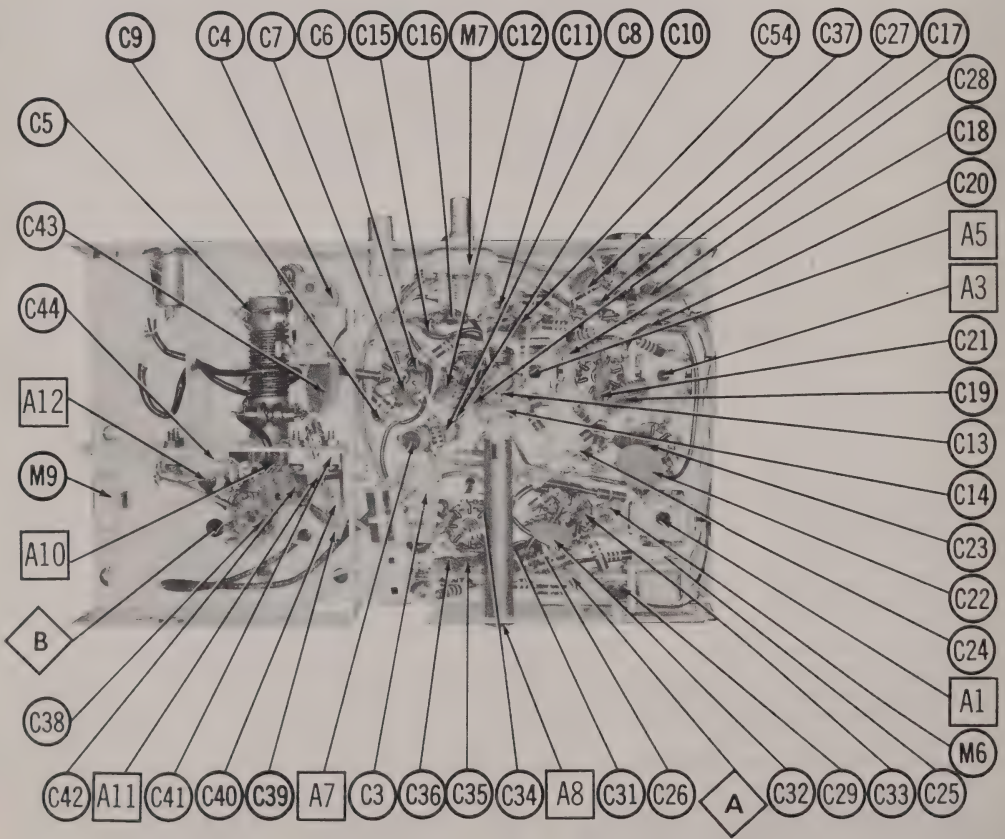
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KZ546

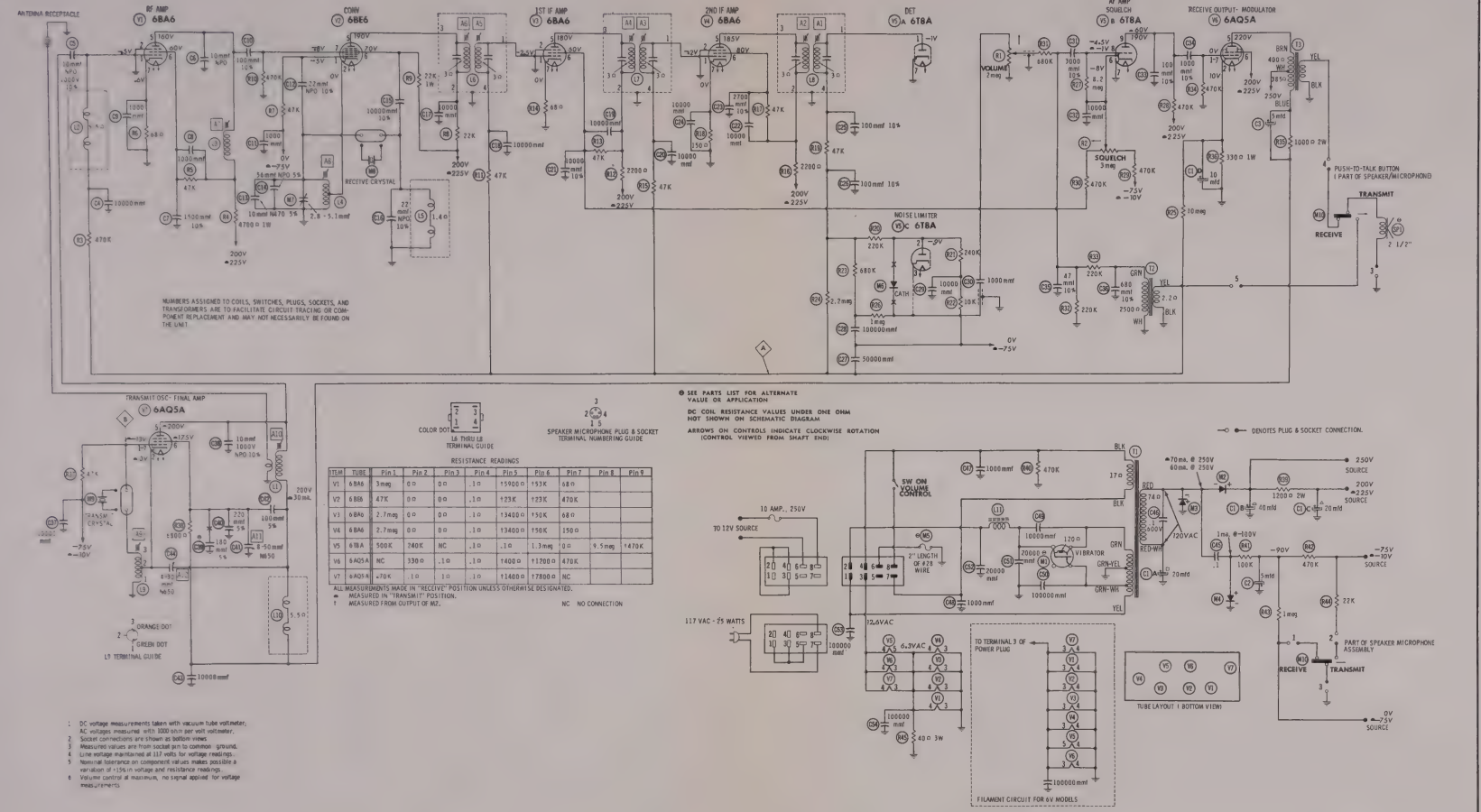
SET 538 FOLDER 10



VIBRATOR CHASSIS-BOTTOM VIEW



CHASSIS BOTTOM VIEW-ALIGN., CAP. & MISC. IDENT.


ANTENNA RECEPTACLE
RF AMP V1 6BA6
CONV V2 6BE6
1ST IF AMP V3 6BA6
2ND IF AMP V4 6BA6
DET V5A 6T8A
AF AMP SQUELCH V5B 6T8A
RECEIVE OUTPUT- MODULATOR V6 6AQ5A
RECEIVE CRYSTAL
VOLUME 2 meg
SQUELCH 3 meg
NOISE LIMITER V5C 6T8A
PUSH-TO-TALK BUTTON (PART OF SPEAKER/MICROPHONE)
TRANSMIT
RECEIVE
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
TRANSMIT OSC- FINAL AMP V7 6AQ5A
TRANSMIT CRYSTAL
ORANGE DOT
GREEN DOT
L9 TERMINAL GUIDE
COLOR DOT
L6 THRU L8 TERMINAL GUIDE
SPEAKER MICROPHONE PLUG & SOCKET TERMINAL NUMBERING GUIDE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
DENOTES PLUG & SOCKET CONNECTION.
SW ON VOLUME CONTROL
10 AMP., 250V
TO 12V SOURCE
117 VAC - 25 WATTS
2" LENGTH OF #28 WIRE
VIBRATOR
120VAC
12.6VAC
6.3VAC
TO TERMINAL 3 OF POWER PLUG
FILAMENT CIRCUIT FOR 6V MODELS
TUBE LAYOUT (BOTTOM VIEW)
250V SOURCE
200V SOURCE
-75V SOURCE
-90V
0V
PART OF SPEAKER MICROPHONE ASSEMBLY
RECEIVE
TRANSMIT

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BA6	3 meg	0 Ω	0 Ω	.1 Ω	†590 Ω	†53K	68 Ω		
V2	6BE6	47K	0 Ω	0 Ω	.1 Ω	†23K	†23K	470K		
V3	6BA6	2.7 meg	0 Ω	0 Ω	.1 Ω	†3400 Ω	†50K	68 Ω		
V4	6BA6	2.7 meg	0 Ω	0 Ω	.1 Ω	†3400 Ω	†50K	150 Ω		
V5	6T8A	500K	240K	NC	.1 Ω	.1 Ω	1.3 meg	0 Ω	9.5 meg	†470K
V6	6AQ5A	NC	330 Ω	.1 Ω	.1 Ω	†400 Ω	†1200 Ω	470K		
V7	6AQ5A	470K	.1 Ω	.1 Ω	.1 Ω	†1400 Ω	†7800 Ω	NC		

RESISTANCE READINGS

ALL MEASUREMENTS MADE IN "RECEIVE" POSITION UNLESS OTHERWISE DESIGNATED.
MEASURED IN "TRANSMIT" POSITION.
† MEASURED FROM OUTPUT OF M2.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common ⏚ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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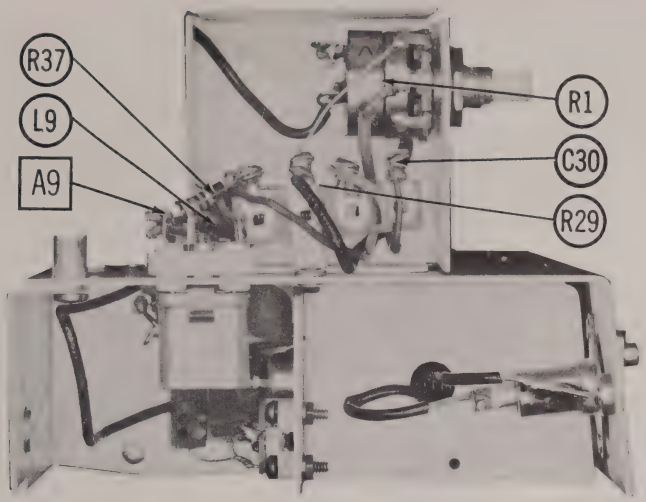
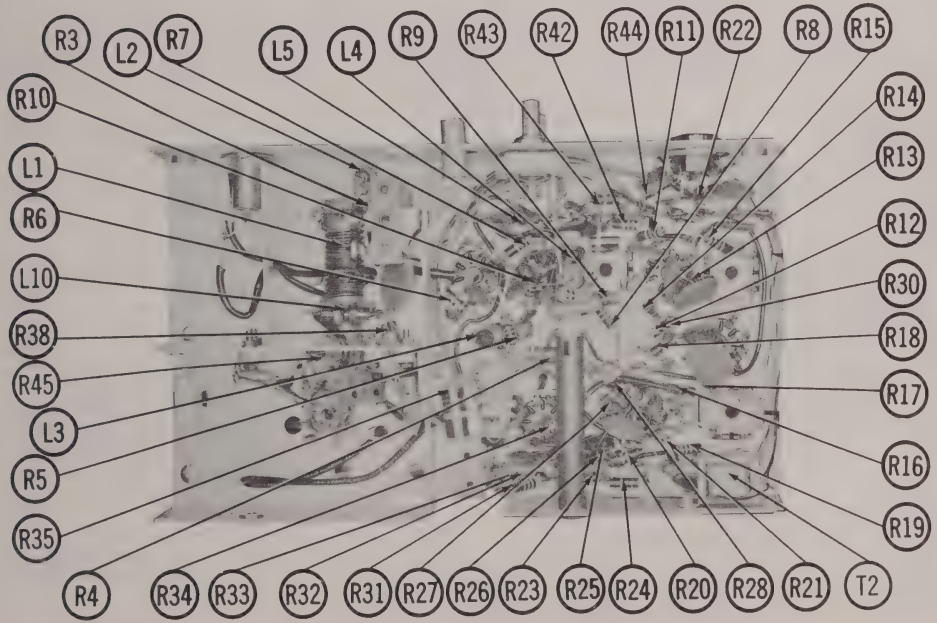
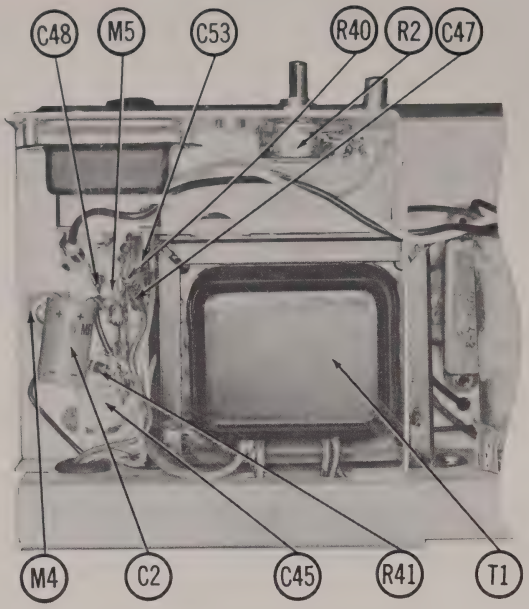
RCA MODEL CRM-P2B-5 (MI-555528, MI-555529)



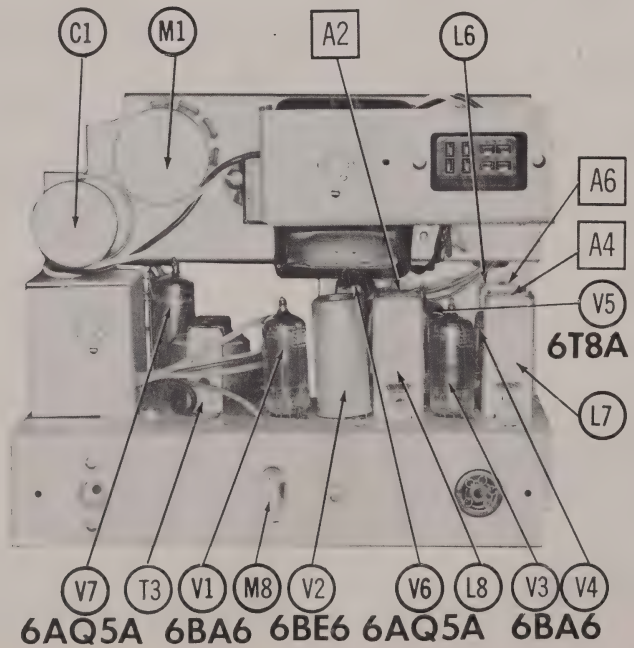
CHASSIS-END VIEW



CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.



POWER CHASSIS-BOTTOM VIEW



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC)	ITEM No.	USE	TYPE (SYLVANIA)
V1	RF Amplifier	6BA6	V5	Det. -Squelch-AF Amp. - Noise Limiter	6T8A
V2	Converter	6BE6	V6	Rec. Output-Modulator	6AQ5A
V3	1st IF Amplifier	6BA6	V7	Trans. Osc. -Final Amp.	6AQ5A
V4	2nd IF Amplifier	6BA6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RCA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■20	350		AFH4-04	D0032	FP420.35	TMQ-4295	TVL-4635	
B	▲40	350							
C	▲20	350							
D	10	350							
C2	5	150		SRE150V5	BBR4-150	TC40	TD-4-150	TVA-1403	
C3	5	150		SRE150V5	BBR4-150	TC40	TD-4-150	TVA-1403	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	10 1000V 10% NPO				C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C6	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C7	1500 10%		DI-1500	DD-152	5R5D15	CCD-152	GP215	10TS-D15
C8	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C9	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C10	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C11	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C12	22 NPO 10%		NPO-DI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C13	10 N470 5%					*		
C14	56 NPO 5%			TCZ-56	C10Q56C	CCTO-560	CNO-456	10TCC-Q56
C15	10000 10%		DI-10000		PM6S1	CCD-103		10TS-S10
C16	22 NPO 10%		NPO-DI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	10000 10%		DI-10000		PM6S1	CCD-103		10TS-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	2700 10%		DI-2700		1R5D27	CCD-272		10TS-D27
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C26	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C27	50000		BPD-05	DD-503	H-05S5	DP-2-503	GP150	5HK-S50
C28	100000			DDA-104	H-05P1	DP-2-104	TA-010	TG-P10
C29	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	1000		DI-1000	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C31	3000 10%		DI-3000		PM6D3	CCD-302	JL-233	10TS-D30
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C34	1000 10%		DI-1000	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C35	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C36	680 10%		DI-680	DD-681	5R5T68	CCD-681	GP368	10TS-T68
C37	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C38	10 1000V NPO 10%				C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C39	180 5%	Note 1	1469-00018	TCZ-180	22R5T18	CM-19B-181J	CNO-318	MS-318
C40	220 5%		1469-00022	TCZ-220	22R5T22	CM-19B-221J	CNO-322	MS-322
C41	8-50 N650			822-AN				
C42	100 5%		1469-0001		22R5T1	CM-19B-101J	MCE235	MS-31
C43	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C44	4-30 N650			822-EN				
C45	.1 400V		P488N-1	DD-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C46	.1 600V		P688N-1	DD-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C47	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C48	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C49	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C50	100000			DDA-104	H-05P1	DP-2-104	TA-010	TG-P10
C51	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C52	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C53	100000			DDA-104	H-05P1	DP-2-104	TA-010	TG-P10
C54	100000			DDA-104	H-05P1	DP-2-104	TA-010	TG-P10

Note 1. Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	1/2		B-76	A47-2meg-Z	Q13-139	U55	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	U8-26	Power Off-On
R2A	3meg	1/2		B-84	A47-3meg-S	Q11-140	U59	Squelch
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	470K			
R4	4700Ω 1W			
R5	47K			
R6	68Ω			
R7	47K			
R8	22K			
R9	22K 1W			
R10	470K			
R11	47K			
R12	2200Ω			
R13	47K			
R14	68Ω			
R15	47K			
R16	2200Ω			
R17	47K			
R18	150Ω			
R19	47K			
R20	220K			
R21	240K			
R22	10K			
R23	680K			
R24	2.2meg			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R25	10meg			
R26	1meg			
R27	8.2meg			
R28	470K			
R29	470K			
R30	470K			
R31	680K			
R32	220K			
R33	220K			
R34	470K			
R35	1000Ω 2W			
R36	330Ω 1W			
R37	47K			
R38	6800Ω			
R39	1200Ω 2W			
R40	470K			
R41	100K			
R42	470K			
R43	1meg			
R44	22K			
R45	40Ω 3W	PW5-40	5W-SQ-40	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA RCA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	Ant.						
L2	RF Choke (100uh)		TV-194	6112	RTC-8574	T305	
L3	RF						
L4	Rec. Osc.						
L5	RF Choke (10uh)		BC-566	4612	RTC-8522	T860	
L6	1st IF						
L7	2nd IF						

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		RCA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L8	3rd IF						
L9	Trans. Osc.						
L10	RF Choke (100uh)		TV-194	6112	RTC-8574	T305	
L11	Hash Choke (27uh)		BC-537	5220	RTC-9182	T980	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	RCA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V ⓐ .5A (AC Only)	120V ⓐ .200A AC	12.6VCT ⓐ 1.2A (AC Operated)						
	12.6VCT ⓐ 2A (DC Only)								

TRANSFORMER (MIC)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	RCA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1	37						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	RCA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	15K Tap ⓐ 7300Ω	3-4Ω						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA PART No.	QUAM PART No.	
SP1	2½"	PM	3-4Ω	8702750-1	25A07	Auxiliary Speakers: Bulkhead Mounting Re-entrant Part #MI-6317-D4 Adjustable Mounting Re-entrant 8½" Part #MI-14859-4 Adjustable Mounting Re-entrant 6 3/8" Part #MI-555504 Universal Mounting Mobile Part #MI-17462

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				RCA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6	115v		6301	G-1601	6301	12V Versions
	Interrupter	6.3	115v		5301	1601	5301	6 V Versions

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	RCA PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M2	.060A		1N1763 *	65 †	SR200 *	* Silicon
M3	.060A		1N1763 *	65 †	SR200 *	† Selenium
M4	.001A			Model 10 †		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RCA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M5	2" Length of #28 Wire							
	3AG	10A * 250V			313010 (3AG 10A 250V)		AGC 10	
	3AG	5A † 250V			313005 (3AG 5A 250V		AGC 5	

* 6 V Versions. † 12 V Versions.

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		RCA PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M6						ANL Detector

MISCELLANEOUS

ITEM No.	PART NAME	RCA PART No.	NOTES
M7	Variable Capacitor		Receiver Osc. Tuning (2.8—5.1mmf)
M8	Crystal		Receive (Order Desired Frequency)
M9	Crystal		Transmit (Order Desired Frequency)
M10	Switch		Push-to-talk (Part of Mike)

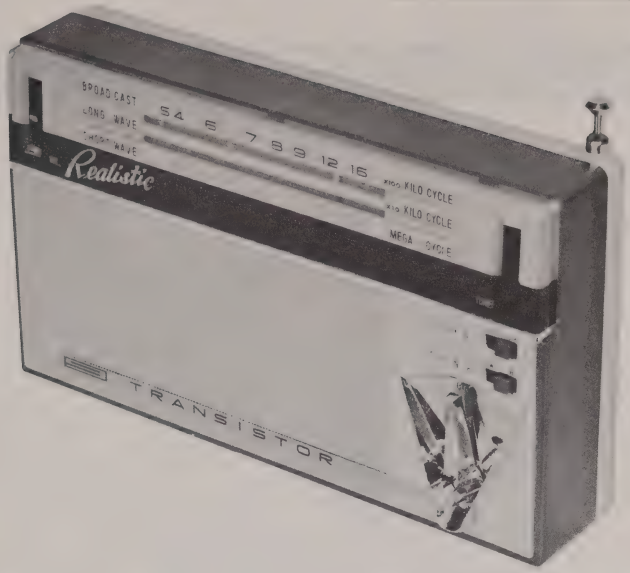
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®

**REALISTIC
MODEL 90LX661**



REALISTIC
MODEL 90LX661

TRADE NAME	Realistic Model 90LX661
SUPPLIER	Radio Shack Corp., 730 Commonwealth Ave., Boston 17, Mass.
TYPE SET	Battery Operated Transistorized Portable BC-SW-LW Receiver
POWER SUPPLY	9 Volts DC RATING 9MA @ 9 Volts DC (No Signal, Min. Volume) 20MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE BROADCAST	540-1600KC SHORT WAVE 6-18MC LONG WAVE 190-400KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A5, A9..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A4, A6, A7, A8, A10, A11. . GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400% Mod.)	(BC) Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	Adjust for maximum output.
3.	"	600KC	600KC	"	A5	"
4.	"	1400KC	1400KC Signal.	"	A6	"
5.	"	400KC	(LW) 400KC	"	A7, A8	"
6.	"	190KC	190KC	"	A9	"
7.	"	18MC	(SW) 18MC	"	A10, A11	"
8.	"	6MC	6MC	"	A12	Adjust for maximum output. If necessary, repeat steps 2 thru 8.

REALISTIC
MODEL 90LX661

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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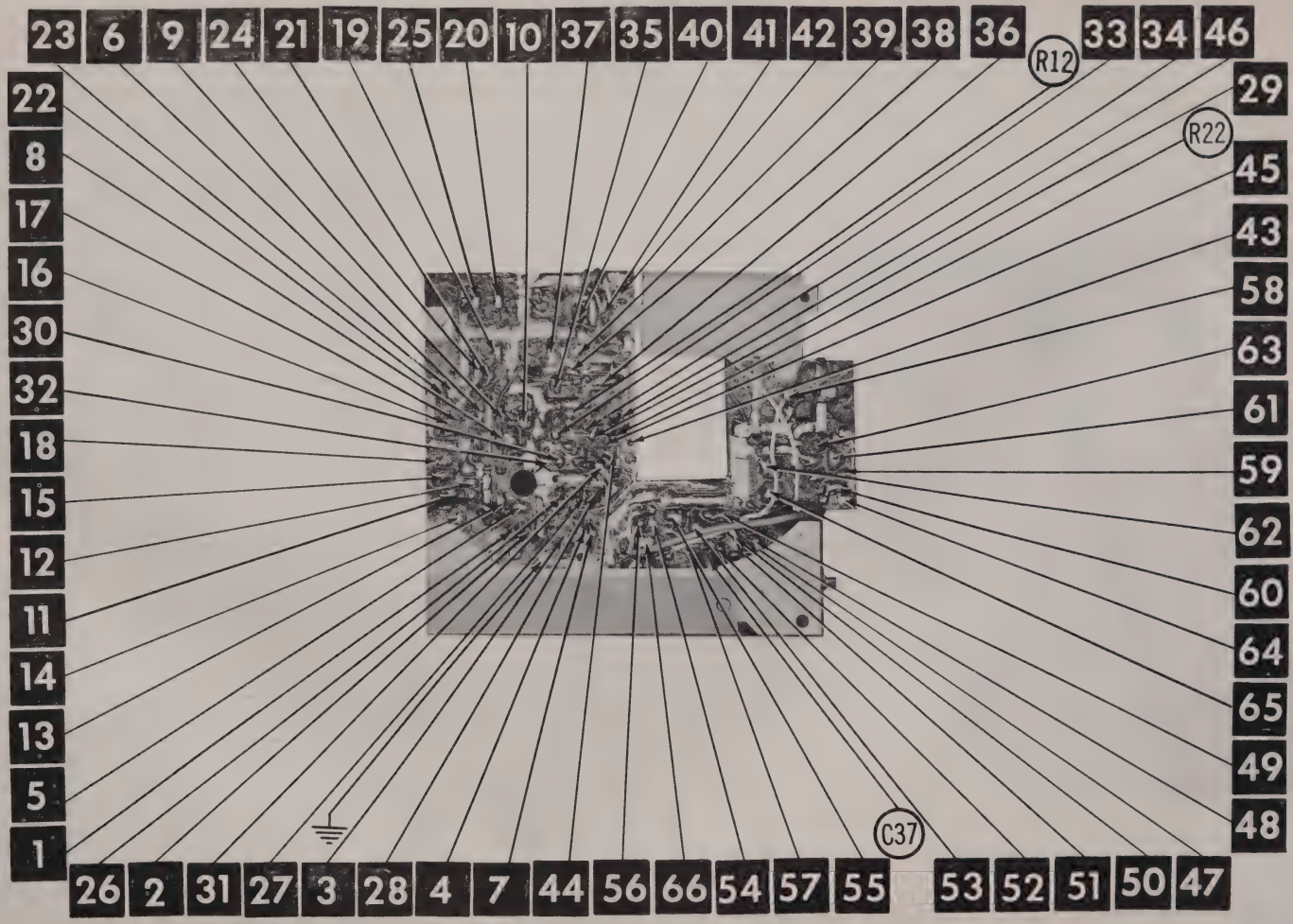
KF566

SET 538 FOLDER 11



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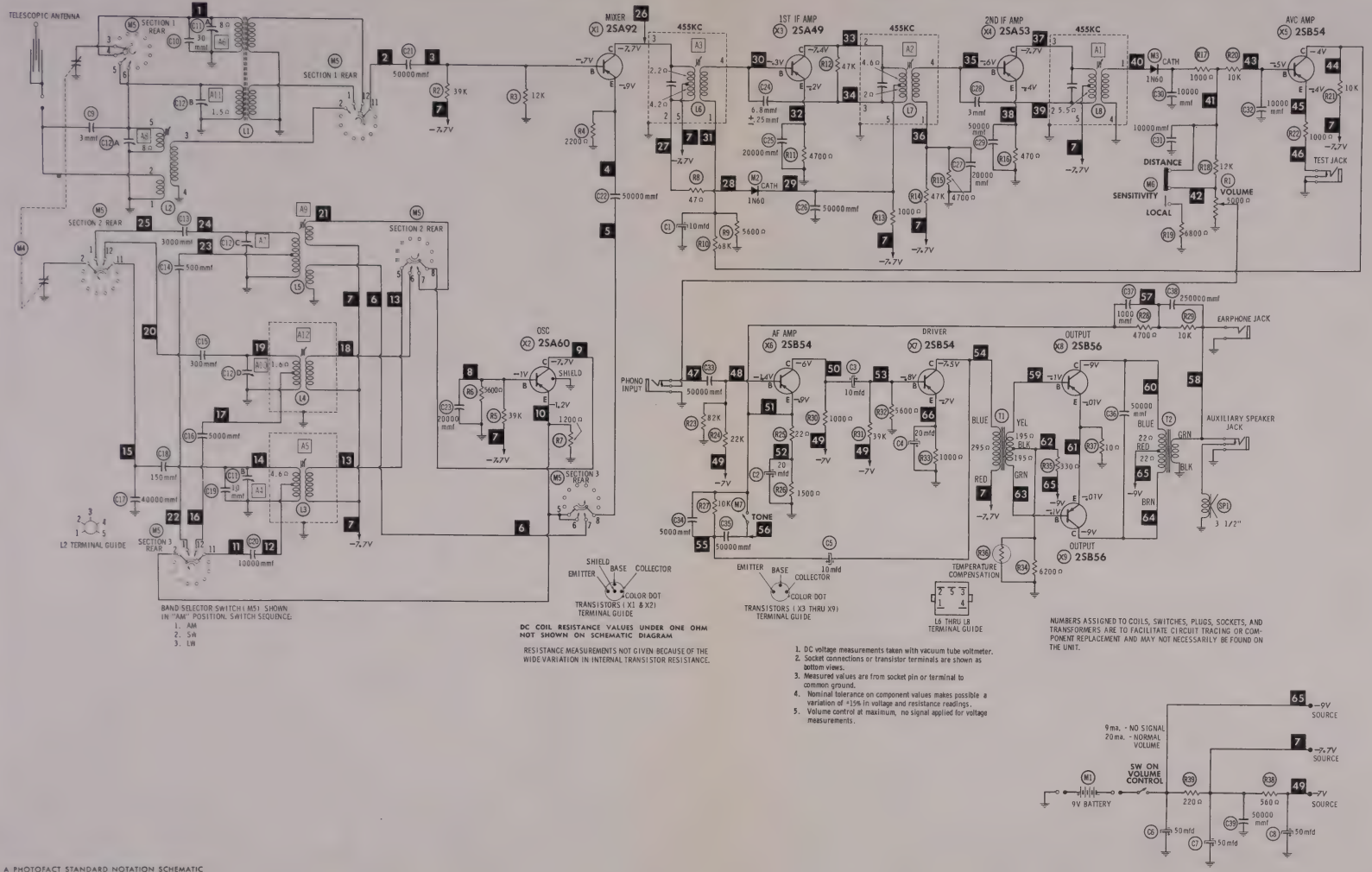
PRINTED BOARD


TELESCOPIC ANTENNA
SECTION 1 REAR
SECTION 2 REAR
SECTION 3 REAR
MIXER X1 2SA92
455KC
1ST IF AMP X3 2SA49
2ND IF AMP X4 2SA53
AVC AMP X5 2SB54
OSC X2 2SA60
AF AMP X6 2SB54
DRIVER X7 2SB54
OUTPUT X8 2SB56
OUTPUT X9 2SB56
PHONO INPUT
EARPHONE JACK
AUXILIARY SPEAKER JACK
DISTANCE
SENSITIVITY
LOCAL
VOLUME
TEST JACK
TONE
TEMPERATURE COMPENSATION
L2 TERMINAL GUIDE
TRANSISTORS (X1 & X2) TERMINAL GUIDE
TRANSISTORS (X3 THRU X9) TERMINAL GUIDE
L6 THRU L8 TERMINAL GUIDE
BAND SELECTOR SWITCH (M5) SHOWN IN "AM" POSITION: SWITCH SEQUENCE.
1. AM
2. SW
3. LW
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
9V BATTERY
SW ON VOLUME CONTROL
9 ma. - NO SIGNAL
20 ma. - NORMAL VOLUME
9V SOURCE
7.7V SOURCE
7V SOURCE

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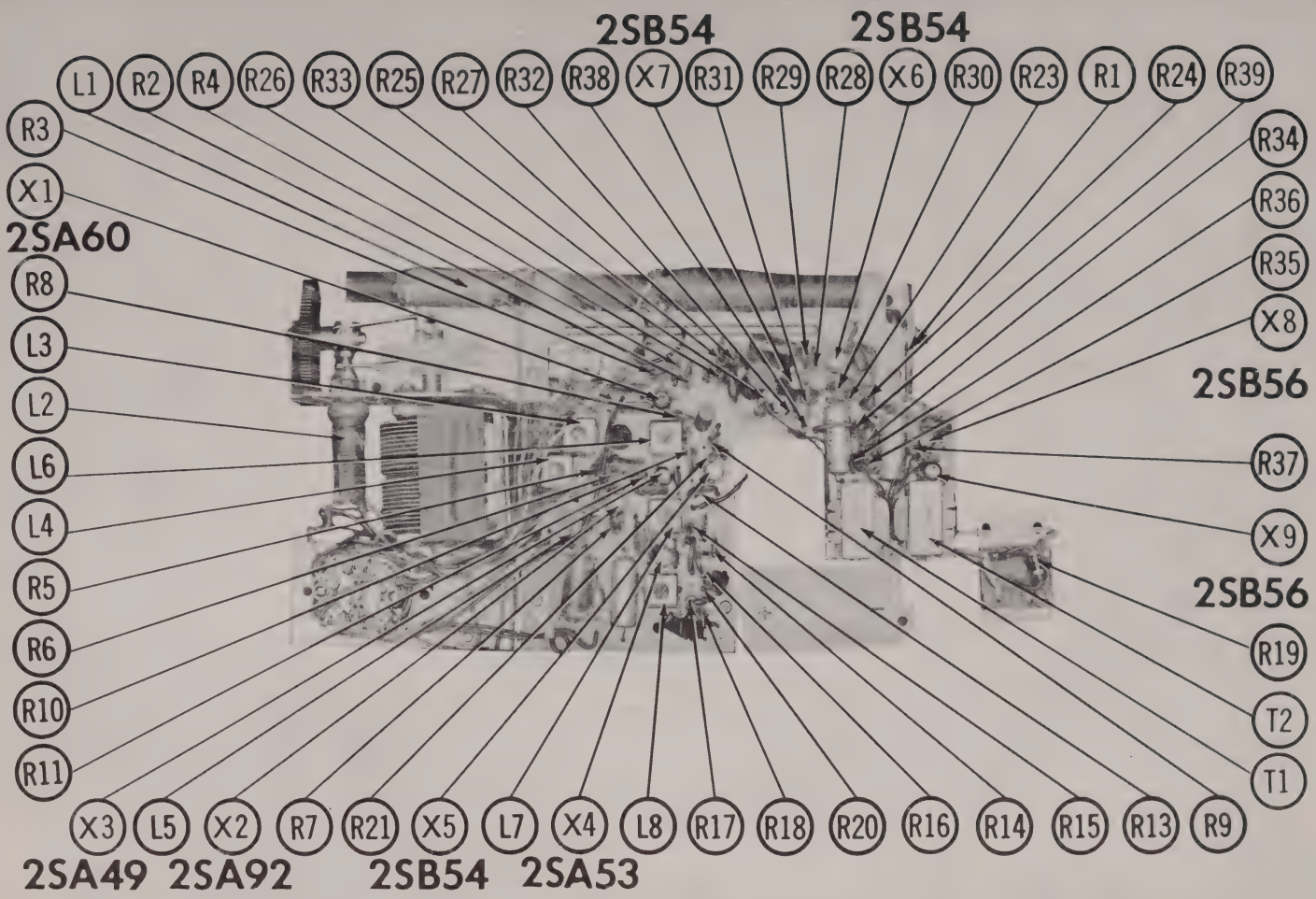
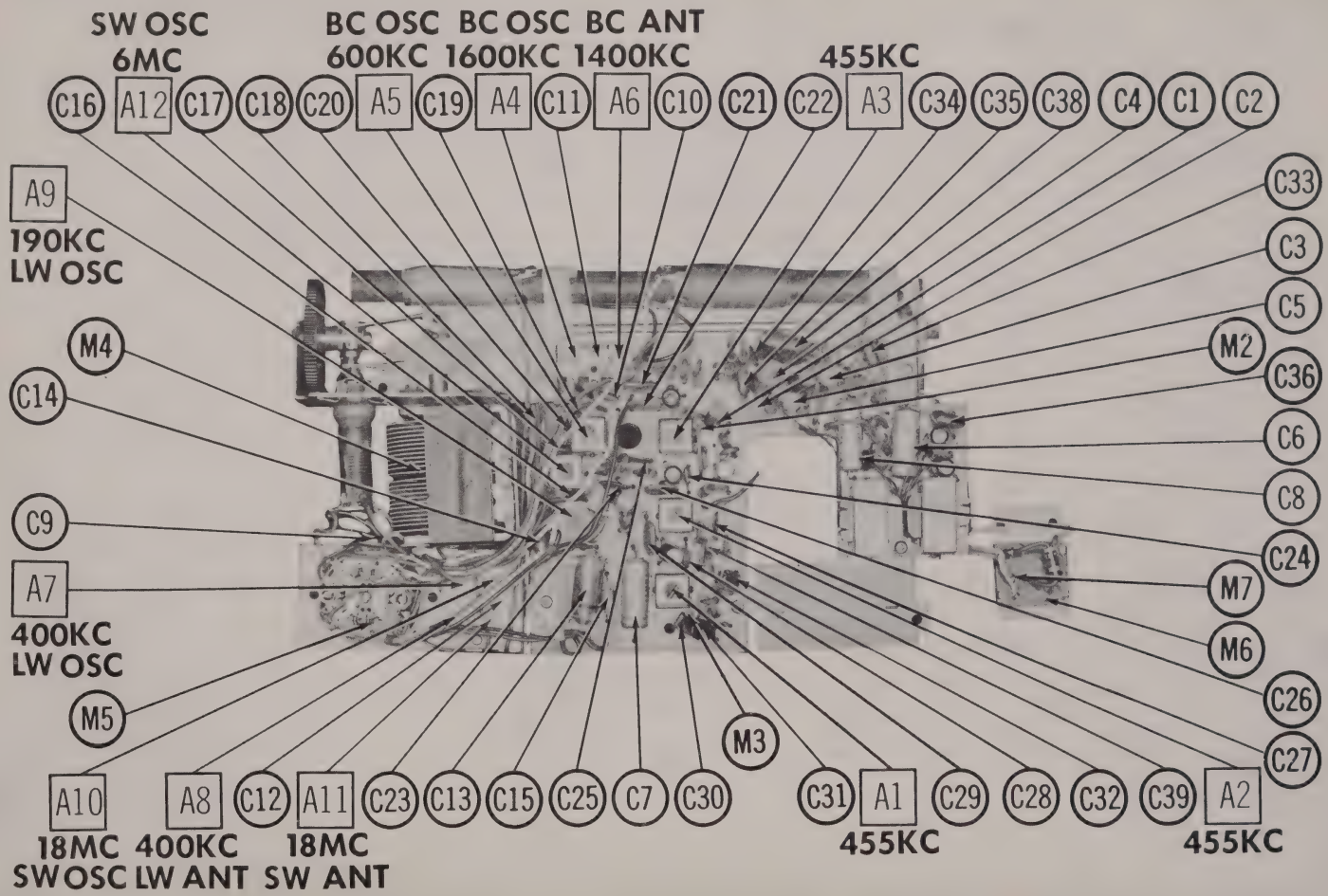
REALISTIC MODEL 90LX661



CHASSIS TOP VIEW-RESISTOR, INDUCTOR & TRANSISTOR IDENT.



CHASSIS TOP VIEW-ALIGNMENT, CAPACITOR & MISC. IDENT.

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2SA60	Mixer				PNP
X2	2SA92	Oscillator				PNP
X3	2SA49	1st IF Amplifier				PNP
X4	2SA53	2nd IF Amplifier				PNP
X5	2SB54	AVC Amplifier	2N406			PNP
X6	2SB54	AF Amplifier	2N406			PNP
X7	2SB54	Driver	2N406			PNP
X8	2SB56	Output	2N408			PNP
X9	2SB56	Output	2N408			PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	REALISTIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	10	3		BCD3010	ECPB408	PET1340	MLV10-3	TE-1053	
C2	20	3		BCD3020	ECPB410	TT15X20	MLV20-12	TE-1054	
C3	10	10		BCD10010	ECPB408	PET1340	MLV10-10	TE-1114	
C4	20	10		BCD12020	ECPB410	TT15X20	MLV20-12	TE-1130	
C5	10	3		BCD3010	ECPB408	PET1340	MLV10-3	TE-1053	
C6	50	10		PTT-10050	NLW50-10	TT10X50	MLV50-10	TE-1119	
C7	50	10		PTT-10050	NLW50-10	TT10X50	MLV50-10	TE-1119	
C8	50	10		PTT-10050	NLW50-10	TT10X50	MLV50-10	TE-1119	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C9	3		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C10	30		DI-33	DD-300	L10Q30	CCD-300	GP430	10TS-Q30
C11A								
B								
C12A								
B								
C								
D								
C13	3000		SI 3000	D6-302	BYA10D3	CCD-302	B-230	10TS-D30
C14	500		SI 500	D6-501	L10T5	CCD-501	B-350	10TS-T50
C15	300		SI 300	D6-301	L10T3	CCD-301	GP330	10TS-T30
C16	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C17	40000							
C18	150		SI 150	D6-151	L10T15	CCD-151	B-315	10TS-T15
C19	10		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	50000		BPD-05	DD-503	H-05S5		GP150	5HK-S50
C22	50000		BPD-05	DD-503	H-05S5		GP150	5HK-S50
C23	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C24	6.8 +.25mmf		NPO-D1 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C25	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C26	50000		BPD-05	DD-503	H-05S5		GP150	5HK-S50
C27	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C28	3		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C29	50000		BPD-05	DD-503	H-05S5		GP150	5HK-S50
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C31	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	50000		BPD-05	DD-503	H-05S5		GP150	5HK-S50
C34	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C35	50000		BPD-05	DD-503	H-05S5		GP150	5HK-S50
C36	50000		BPD-05	DD-503	H-05S5		GP150	5HK-S50
C37	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C38	250000							
C39	50000		BPD-05	DD-503	H-05S5		GP150	5HK-S50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	REALISTIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4						Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	39K				R21	10K			
R3	12K				R22	1000Ω			
R4	2200Ω				R23	82K			
R5	39K				R24	22K			
R6	5600Ω				R25	22Ω			
R7	1200Ω				R26	1500Ω			
R8	47Ω				R27	10K			
R9	5600Ω				R28	4700Ω			
R10	68K				R29	10K			
R11	4700Ω				R30	1000Ω			
R12	47K				R31	39K			
R13	1000Ω				R32	5600Ω			
R14	47K				R33	1000Ω			
R15	4700Ω				R34	6200Ω			
R16	470Ω				R35	330Ω			
R17	1000Ω				R36	Temp. Comp.			
R18	12K				R37	10Ω			
R19	6800Ω				R38	560Ω			
R20	10K				R39	220Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		REALISTIC PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1A	BC Loopstick						
B	SW Loopstick						
L2	LW Ant.						
L3	BC Osc.						
L4	SW Osc.						
L5	LW Osc.						
L6	1st IF						
L7	2nd IF						
L8	3rd IF						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	REALISTIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.8	1	0738A					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	REALISTIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	350Ω CT	6-8Ω	07101A					

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	REALISTIC PART No.	QUAM PART No.	
SP1	3½"	PM	6-8Ω	SP-3503B		

BATTERIES

ITEM No.	VOLTAGE	REALISTIC	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
		PART No.	"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	BL-R006		P6		226		M-1600	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		REALISTIC PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60			1N60	1N60	Overload Limiter
M3	1N60			1N60	1N60	Detector

MISCELLANEOUS

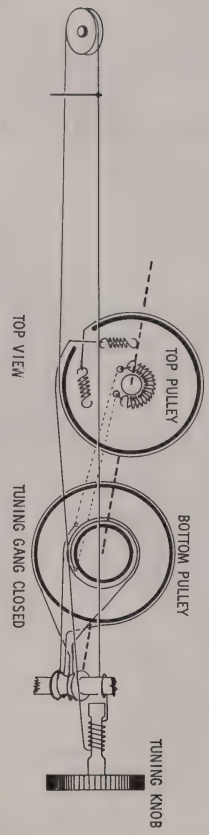
ITEM No.	PART NAME	REALISTIC PART No.	NOTES
M4	Tuning Cap.		2 Gang
M5	Switch		Band Selector (Rotary Type)
M6	Switch		Sensitivity (DPDT Slide Type)
M7	Switch		Tone (DPDT Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

DIAL CORD STRINGING



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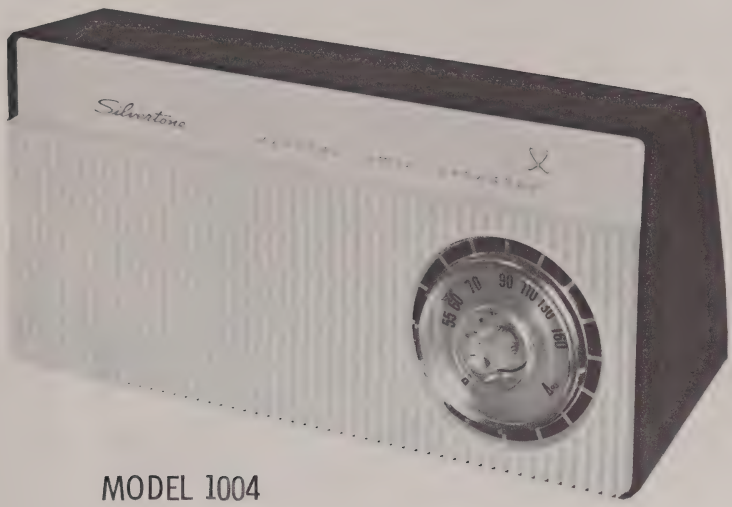
SILVERTONE MODELS 1004, 1005, 1006, 2004, 2005, 2006 (Ch. 132.50701, 132-64201)

SILVERTONE MODELS 1004, 1005, 1006, 2004, 2005, 2006 (Ch. 132.50701, 132-64201)



MODEL 1004

SILVERTONE MODELS 1004, 1005, 1006, 2004, 2005, 2006 (Ch. 132.50701, 132-64201)

TRADE NAME	Silvertone Models 1004, 1005, 1006 (Ch. 132.50701) ; 2004, 2005, 2006 (Ch. 132.64201)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC-DC Operated 5 Tube AM Receiver
POWER SUPPLY	110 - 120 Volts AC-DC
TUNING RANGE—BROADCAST	540 — 1600KC RATING 20 Watts, .2 Amp. @117 Volts AC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4, A6... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A7..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

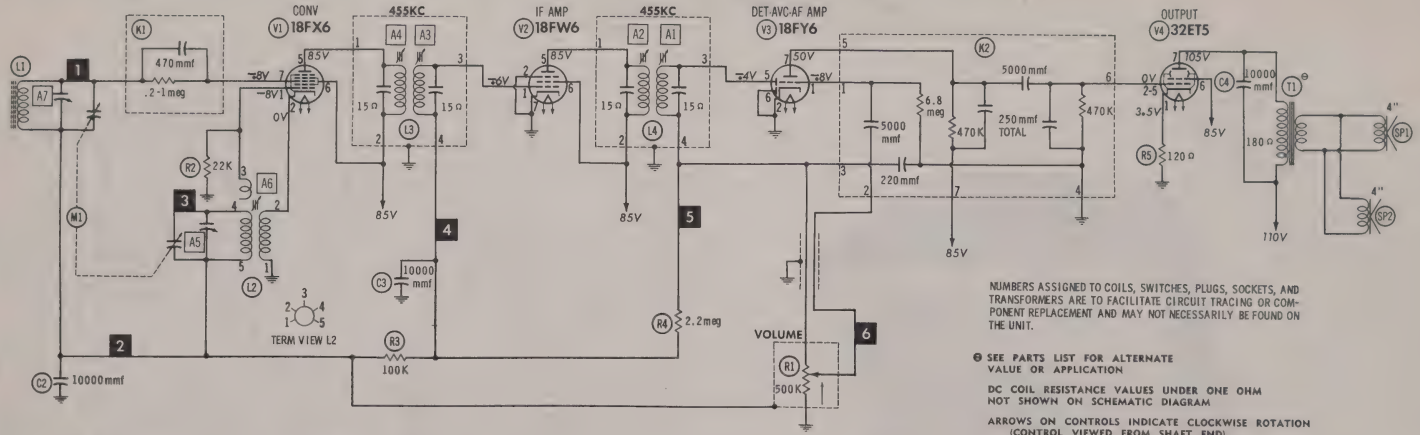
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1670KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	600KC	600KC	"	A6	"
4.	"	1400KC	1400KC Signal.	"	A7	Adjust for maximum output. Repeat Steps 2, 3 and 4.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KG538

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SET 538 FOLDER 12



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

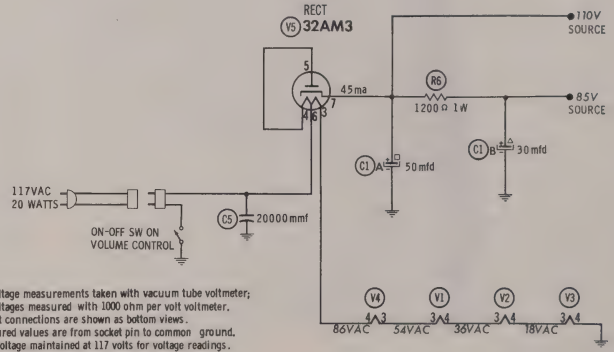
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

TERM VIEW L3 & L4

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	18FX6	22K	.1Ω	60Ω	40Ω	†1200Ω	†1200Ω	3.2meg
V2	18FW6	2.7meg	0Ω	40Ω	20Ω	†1200Ω	†1200Ω	0Ω
V3	18FY6	6.8meg	0Ω	20Ω	0Ω	500K	0Ω	†470K
V4	32ET5	120Ω	470K	60Ω	100Ω	NC	†1200Ω	†180Ω
V5	36AM3	NC	NC	100Ω	192Ω	192Ω	190Ω	¶ INF

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5. NC NO CONNECTION



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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SILVERTONE MODELS 1004, 1005, 1006, 2004, 2005, 2006 (Ch. 132.50701, 132-64201)

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	• GENERAL ELECTRIC •		• RAYTHEON •	• SYLVANIA •	
V1	Converter	18FX6	V4	Output	32ET5
V2	IF Amplifier	18FW6	V5	Rectifier	36AM3
V3	Det.-AVC-AF Amp.	18FY6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■50	150	43711-9	PWH2-15-05	B0150 †	PFP213.1	TMD-2105 ‡	PCL-2432	
B	▲30	150							

† Use printed circuit adapters 55277 & 55278.
‡ Use printed circuit adapter kit TMA.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	500K	½	47500-16					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	22K			
R3	100K			
R4	2.2meg			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	120Ω			
R6	1200Ω 1W			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	Antenna Filter	470mmf, .2-1meg	47796-1	Centralab RC 471 Sprague AC1-1
K2	Audio Coupling	220mmf, 250mmf, (2) 5000mmf, (2) 470K, 6.8meg	43743-2	Aerovox PA-512-3 Centralab PC-158 Sprague DT-5

PRINTED BOARD

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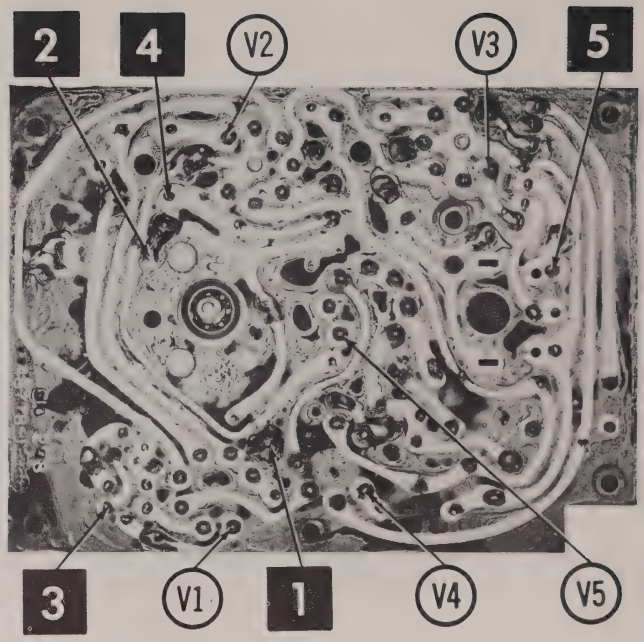
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		SILVERTONE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick	46568-5	BC-419	2001		T532	
L2	Osc.	43644-1					
L3	Input IF	44282-1	BC-356	13-PC9	RTC-8683	T614	
L4	Output IF	44282-1	BC-357	13-PC10	RTC-8684	T615	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SILVERTONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2600Ω	3-4Ω	42700-20 ①	A-3025	A-3332	24S53	S-12X	① Alternate Part #42700-21

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	4"	PM	6-8Ω	45600-13	4A07Z6	
SP2	4"	PM	6-8Ω	45600-7	4A07Z6	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Tuning Cap.	48964-1	2 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

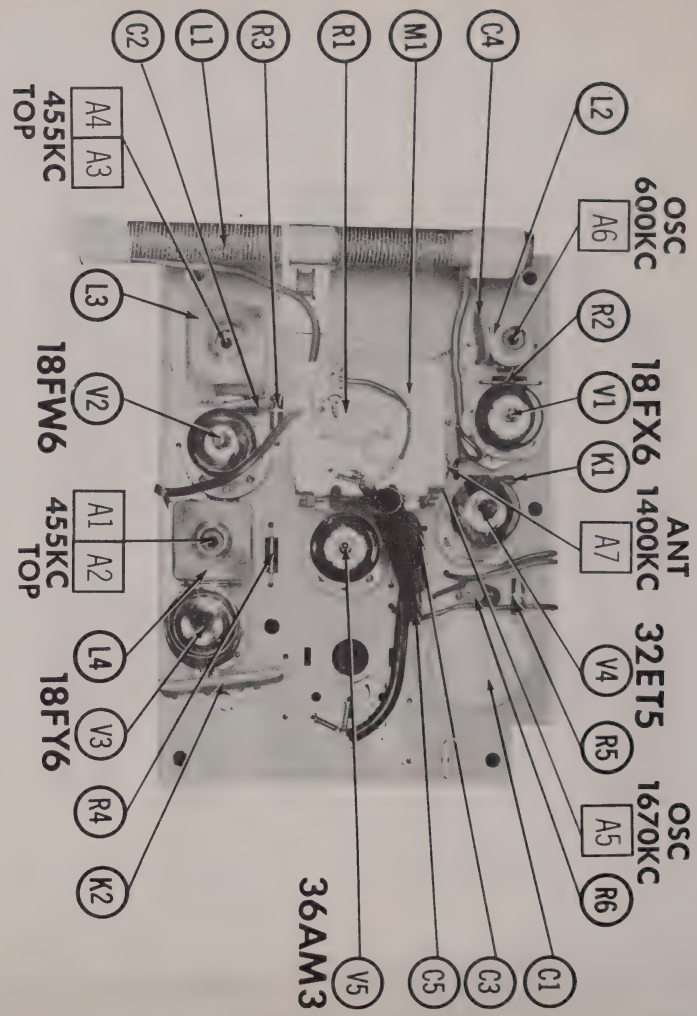
NAME	PART NO.	DESCRIPTION
Dial Scale	48492	
Knob	48484	Tuning
Knob	48483	Volume
Cabinet Front	48491-67	Ivory, Models 1004, 1005, 1006
Cabinet Back	48493-83	Coral
Cabinet Back	48493-67	Ivory
Cabinet Back	48493-48	Brown
Cabinet Front	49615-67	Ivory, Models 2004, 2005, 2006

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

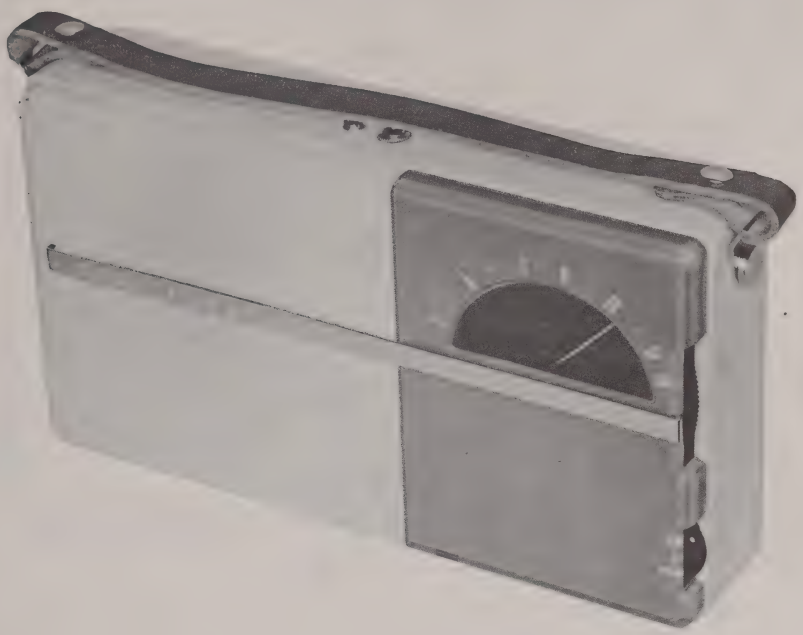
CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

SONY
MODEL TR-608

SONY
MODEL TR-608



SONY
MODEL TR-608

TRADE NAME	Sony Model TR-608
IMPORTER	Sony Corp. of America, 514 Broadway, New York 12, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	4.5 Volts DC
RATING	8MA @ 4.5 Volts DC (No Signal, Min. Volume) 20MA @ 4.5 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	535 – 1605KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A4, A7... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A5..... GENERAL CEMENT #9440

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver.
2.	"	1600KC	1600KC	"	A4	"
3.	"	600KC	600KC	"	A5, A6	"
4.	"	1400KC	1400KC Signal.	"	A7	Adjust for maximum output. Repeat Steps 2, 3 and 4.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KF534

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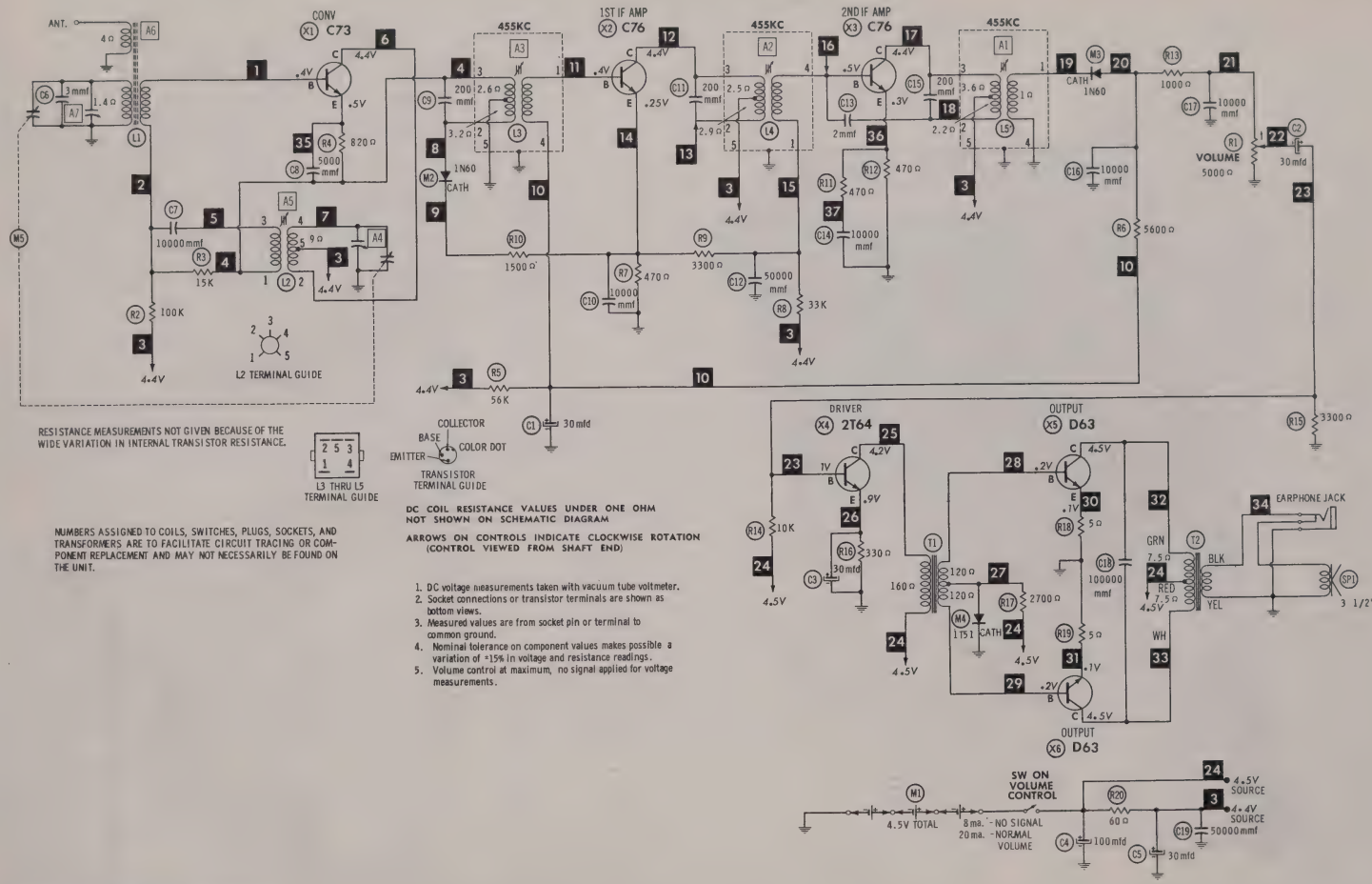
SET 538 FOLDER 13


ANT.
CONV
X1 C73
1ST IF AMP
X2 C76
2ND IF AMP
X3 C76
455KC
455KC
455KC
CATH
1N60
VOLUME
5000Ω
DRIVER
X4 2T64
OUTPUT
X5 D63
OUTPUT
X6 D63
EARPHONE JACK
L2 TERMINAL GUIDE
L3 THRU L5 TERMINAL GUIDE
TRANSISTOR TERMINAL GUIDE
COLLECTOR
BASE
EMITTER
COLOR DOT
SW ON VOLUME CONTROL
4.5V TOTAL
8 ma. - NO SIGNAL
20 ma. - NORMAL VOLUME
4.5V SOURCE
4.4V SOURCE
RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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SONY
MODEL TR-608

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	C73	Converter				NPN
X2	C76	1st IF Amplifier				NPN
X3	C76	2nd IF Amplifier				NPN
X4	2T64	Driver				NPN
X5	D63	Output				NPN
X6	D63	Output				NPN

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	SONY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	6		PTT-6030	NLW30-6	TT6X30	MLV30-6	TE-1092	
C2	30	6		PTT-6030	NLW30-6	TT6X30	MLV30-6	TE-1092	
C3	30	6		PTT-6030	NLW30-6	TT6X30	MLV30-6	TE-1092	
C4	100	6		PTT-6100	NLW100-12	TT6X100	MLV100-6	TE-1102	
C5	30	6		PTT-6030	NLW30-6	TT6X30	MLV30-6	TE-1092	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	3		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C7	10000		C80V103AM	DM-103	H-05S1	CCD-103	TA-110	TG-S10
C8	5000		C80V502AM	DM-502	H-05S5	CCD-502	TA-250	TG-D50
C9	200		SI 200	D6-201	L10T2	CCD-201	GP320	10TS-T20
C10	10000		C80V103AM	DM-103	H-05S1	CCD-103	TA-110	TG-S10
C11	200		SI 200	D6-201	L10T2	CCD-201	GP320	10TS-T20
C12	50000		C80V503AM	DA-503	H-05S5	IDP-2-503	TA-150	TG-S50
C13	2		NPO-DI 2.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C14	10000		C80V103AM	DM-103	H-05S1	CCD-103	TA-110	TG-S10
C15	200		SI 200	D6-201	L10T2	CCD-201	GP320	10TS-T20
C16	10000		C80V103AM	DM-103	H-05S1	CCD-103	TA-110	TG-S10
C17	10000		C80V103AM	DM-103	H-05S1	CCD-103	TA-110	TG-S10
C18	100000		C80V104AM	DA-104	H-05P1	IDP-2-104	TA-010	TG-P10
C19	50000		C80V503AM	DA-503	H-05S5	IDP-2-503	TA-150	TG-S50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SONY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/10						Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	100K				R12	470Ω			
R3	15K				R13	100Ω			
R4	820Ω				R14	10K			
R5	56K				R15	3300Ω			
R6	5600Ω				R16	330Ω			
R7	470Ω				R17	2700Ω			
R8	33K				R18	5Ω			
R9	3300Ω				R19	5Ω			
R10	1500Ω				R20	60Ω			
R11	470Ω								

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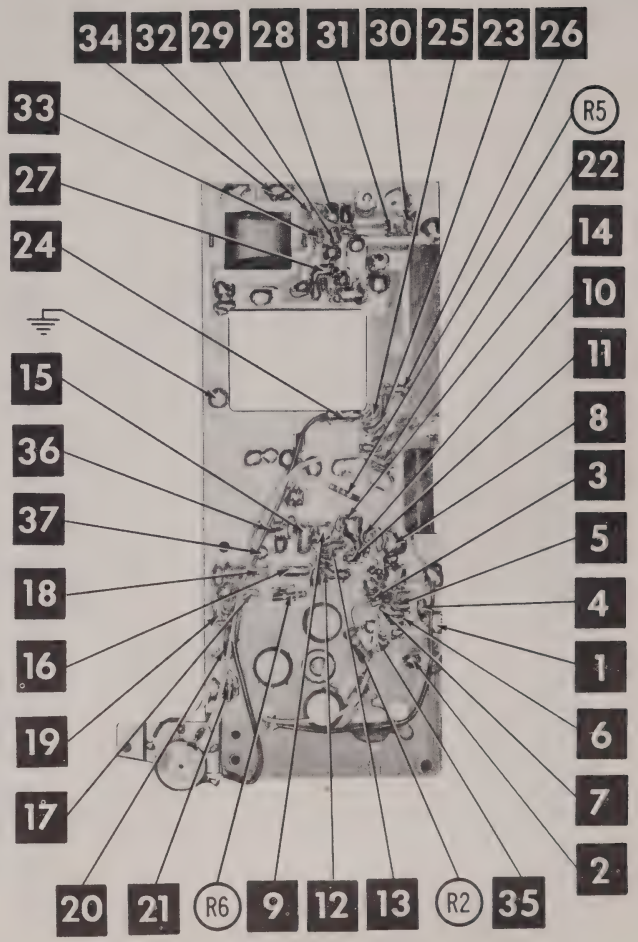


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		SONY PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick	LA-561-6F					
L2	Oscillator	LO-006-Q					
L3	1st IF	LI-001-AP					
L4	2nd IF	LI-001-BP					
L5	3rd IF	LI-001-CP					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SONY PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1	1	TI-001		TA-30			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SONY PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	350Ω CT	6-8Ω	TX-001					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SONY PART No.	QUAM PART No.	
SP1	3½"	PM	6-8Ω	A039-007		

BATTERIES

ITEM No.	VOLTAGE	SONY PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	UM-2		130		635		M-14R	3 Required

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		SONY PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60			1N60	1N60	Overload
M3	1N60			1N60	1N60	Detector - AVC
M4	1T51					Bias Regulator

MISCELLANEOUS

ITEM No.	PART NAME	SONY PART No.	NOTES
M5	Tuning Cap.	A039-002	2 Gang
	Earphone	211-815	(ME-7)

CABINETS & CABINET PARTS

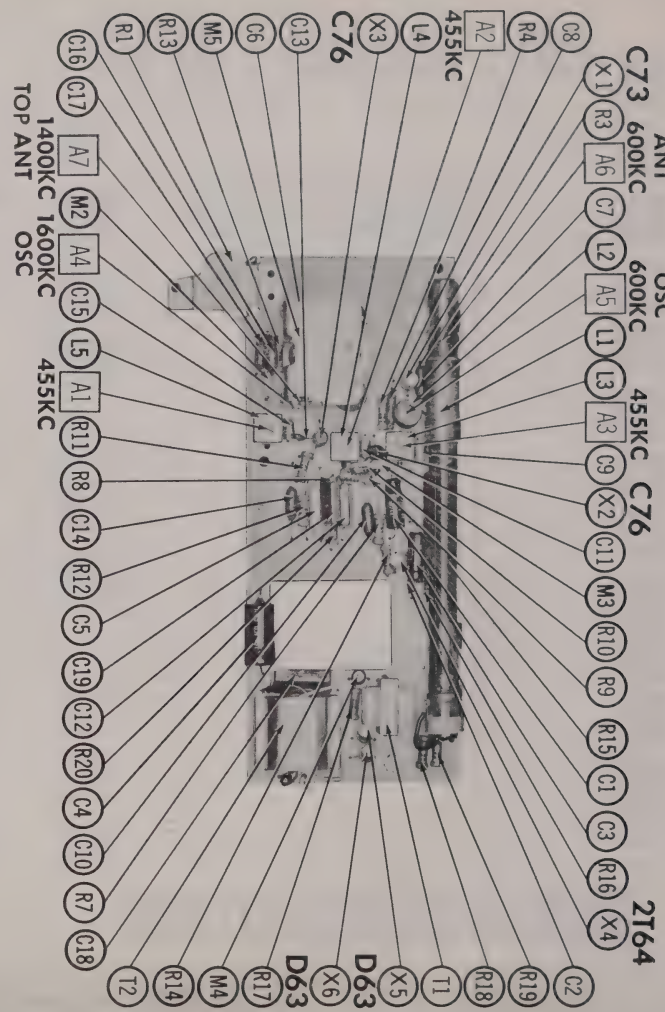
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Scale	031-603	
Dial Pointer	031-607	
Knob	031-605	Tuning
Knob	031-606	Volume
Cabinet	031-601	Includes Dial Scale & Rear Cover

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

SYLVANIA MODELS 8P18B, 8P18W (Ch. 673-1)

SYLVANIA MODELS
8P18B, 8P18W (Ch. 673-1)

TRADE NAME	Sylvania Models 8P18B, 8P18W (Ch. 673-1)		
MANUFACTURER	Sylvania Home Electronics, Div. of Sylvania Electric Products, Inc., 700 Ellicott St., Batavia, N. Y.		
TYPE SET	Battery Operated Transistorized Portable AM Receiver		
POWER SUPPLY	9 Volts DC	RATING	16 MA @ 9 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 — 1600KC		20 MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A5.... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A6..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1650KC	"	"	A4	"
3.	"	600KC	600KC	"	A5	"
4.	"	1450KC	1450KC Signal.	"	A6	Adjust for maximum output. Repeat Steps 2, 3 and 4.

DISASSEMBLY

1. Pull off volume control knob.
2. Remove 2 screws holding case front to case back. Remove front.
3. Remove dial plate from tuning knob.
4. Remove screw holding tuning knob. Remove knob.
5. Remove 3 chassis mounting screws. (Top left corner, bottom right corner, and near tuning gang).

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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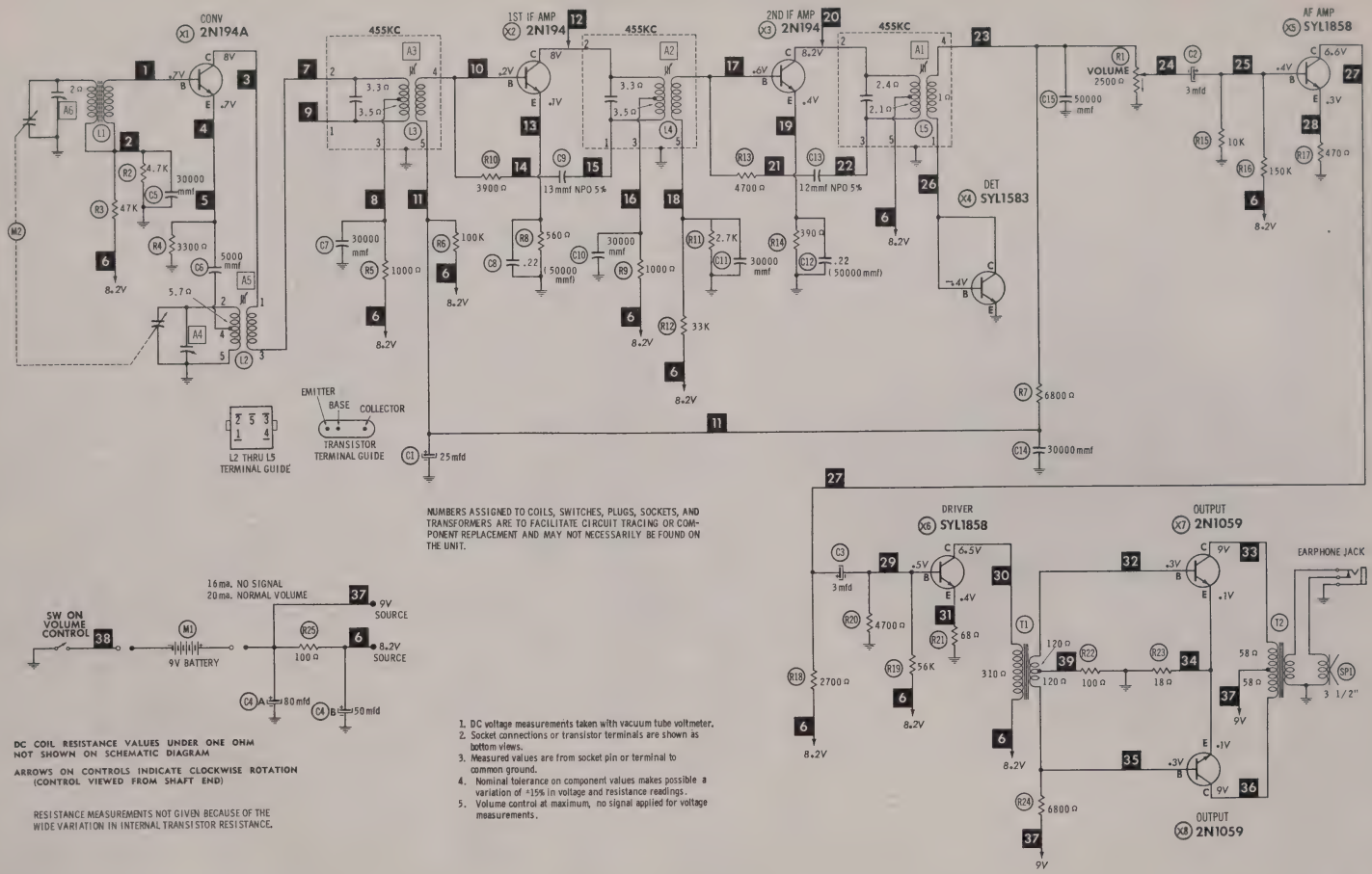
SET 538 FOLDER 14



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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SYLVANIA MODELS 8P18B, 8P18W (Ch. 673-1)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N194A	Converter		2N1367	2N194	NPN
X2	2N94	1st IF Amplifier	2N410	2N1367	2N94	NPN
X3	2N94	2nd IF Amplifier	2N410	2N1367	2N94	NPN
X4	SYL1583	Detector	2N410	CK879		NPN
X5	SYL1858	AF Amp.	2N649			NPN
X6	SYL1858	Driver	2N649			NPN
X7	2N1059	Output				NPN
X8	2N1059	Output				NPN

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	25	3	161-1049	PTT-3025	NLW25-3	TT3X25	MLV25-3	TE-1055	
C2	3	10	161-1068	PTT-10003	NLW3-25	TT12X3	MLV5-12	TE-1122	
C3	3	10	161-1068	PTT-10003	NLW3-25	TT12X3	MLV5-12	TE-1122	
C4A	80	10	161-2020	BCD10X8050	ECPAN6	PETA2385	MLV100-12	VL-2350	
B	50	10					MLV50-12		

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	30000			DD-303	BYB6S3	CCD-303	GPI30	TG-S30
C6	5000		BPD-005	DD-502	H-05D5	CCD-502	TA-250	TG-D50
C7	30000			DD-303	BYB6S3	CCD-303	GPI30	TG-S30
C8	.22mfd	Note 1		UK-224				HY-125
C9	13 NPO 5%			TCZ-12	C10Q13C	CCTO-120	CNO-412	10TCC-Q12
C10	30000			DD-303	BYB6S3	CCD-303	GPI30	TG-S30
C11	30000			DD-303	BYB6S3	CCD-303	GPI30	TG-S30
C12	.22 mfd	Note 1		UK-224				HY-125
C13	12 NPO 5%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C14	30000			DD-303	BYB6S3	CCD-303	GPI30	TG-S30
C15	50000		C80V503AM	DD-503	H-05B5		TA-150	TG-S50

Note 1. Some versions may use 50000mmf in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	2500Ω	1/4	152-0062					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	4700Ω				R14	390Ω			
R3	47K				R15	10K			
R4	3300Ω				R16	150K			
R5	1000Ω				R17	470Ω			
R6	100K				R18	2700Ω			
R7	6800Ω				R19	56K			
R8	560Ω				R20	4700Ω			
R9	1000Ω				R21	68Ω			
R10	3900Ω				R22	100Ω			
R11	2700Ω				R23	18Ω			
R12	33K				R24	6800Ω			
R13	4700Ω				R25	100Ω			

PRINTED BOARD

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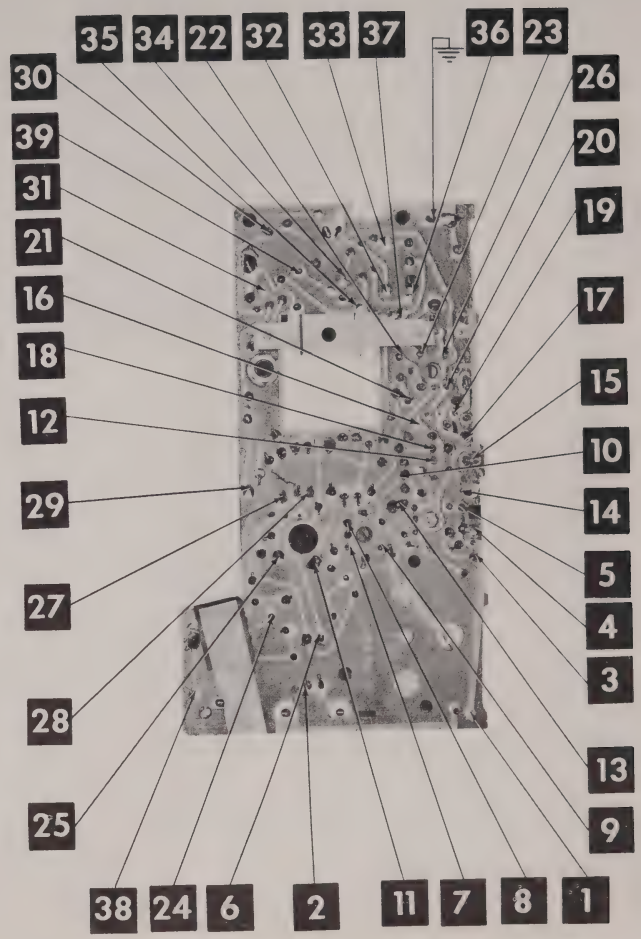


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		SYLVANIA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick	581-0026					
L2	Osc.	113-0082					
L3	1st IF	121-0113					
L4	2nd IF	121-0113					
L5	3rd IF	122-0040					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SYLVANIA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1, 4	1	143-0078					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SYLVANIA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	500Ω CT	3-4Ω	143-0100			TR-114		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP1	3½"	PM	3-4Ω	539-0353		

BATTERIES

ITEM No.	VOLTAGE	SYLVANIA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V					2709			

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M2	Tuning Cap.	170-0050	2 Gang

CABINETS & CABINET PARTS

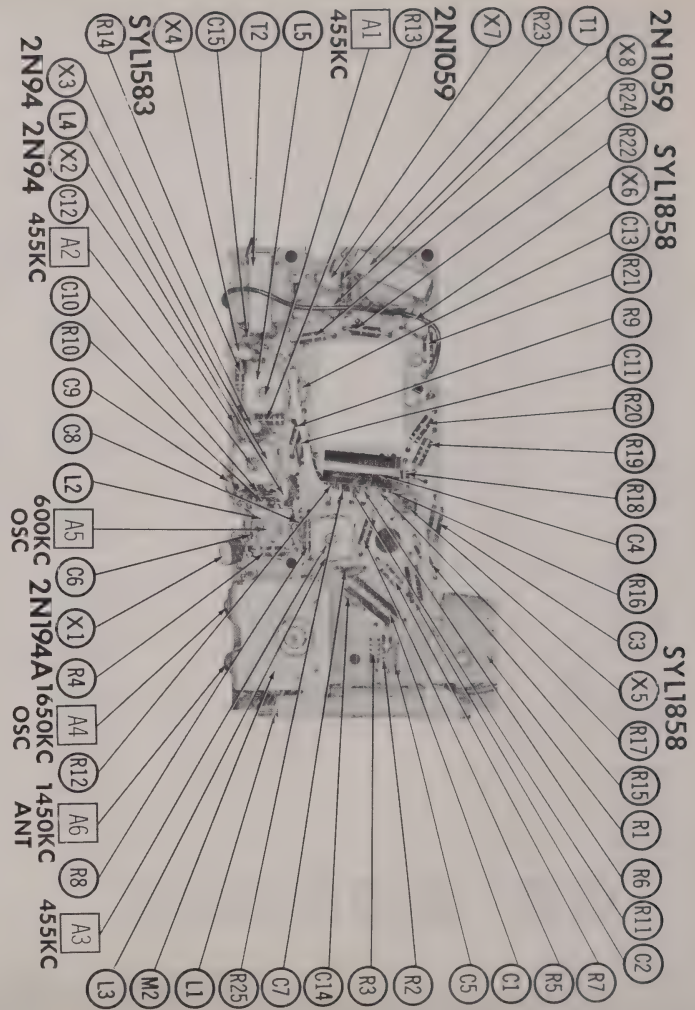
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial	722-0055	Tuning
Knob	742-0046	Volume, Model 8P18B
Knob	742-0053	Volume, Model 8P18W
Handle	818-0159	
Cabinet Back	822-0128	Model 8P18B
Cabinet Back	822-0136	Model 8P18W
Cabinet Front	822-0126	Model 8P18B
Cabinet Front	822-0127	Model 8P18W

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

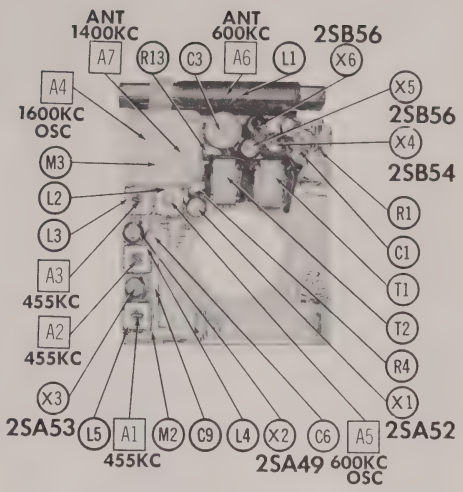
CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

TOSHIBA
MODEL 6TP-394

TOSHIBA
MODEL 6TP-394



TOSHIBA
MODEL 6TP-394

TRADE NAME	Toshiba Model 6TP-394
IMPORTER	Transistor World Corp., 52 Broadway, New York 4, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	4.5 Volts DC RATING 4MA @ 4.5 Volts DC (No Signal, Min. Volume) 12MA @ 4.5 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540 — 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A5.... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A7.....GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	"
3.	"	600KC	600KC	"	A5, A6	"
4.	"	1400KC	1400KC Signal.	"	A7	Adjust for maximum output. Repeat Steps 2, 3 and 4.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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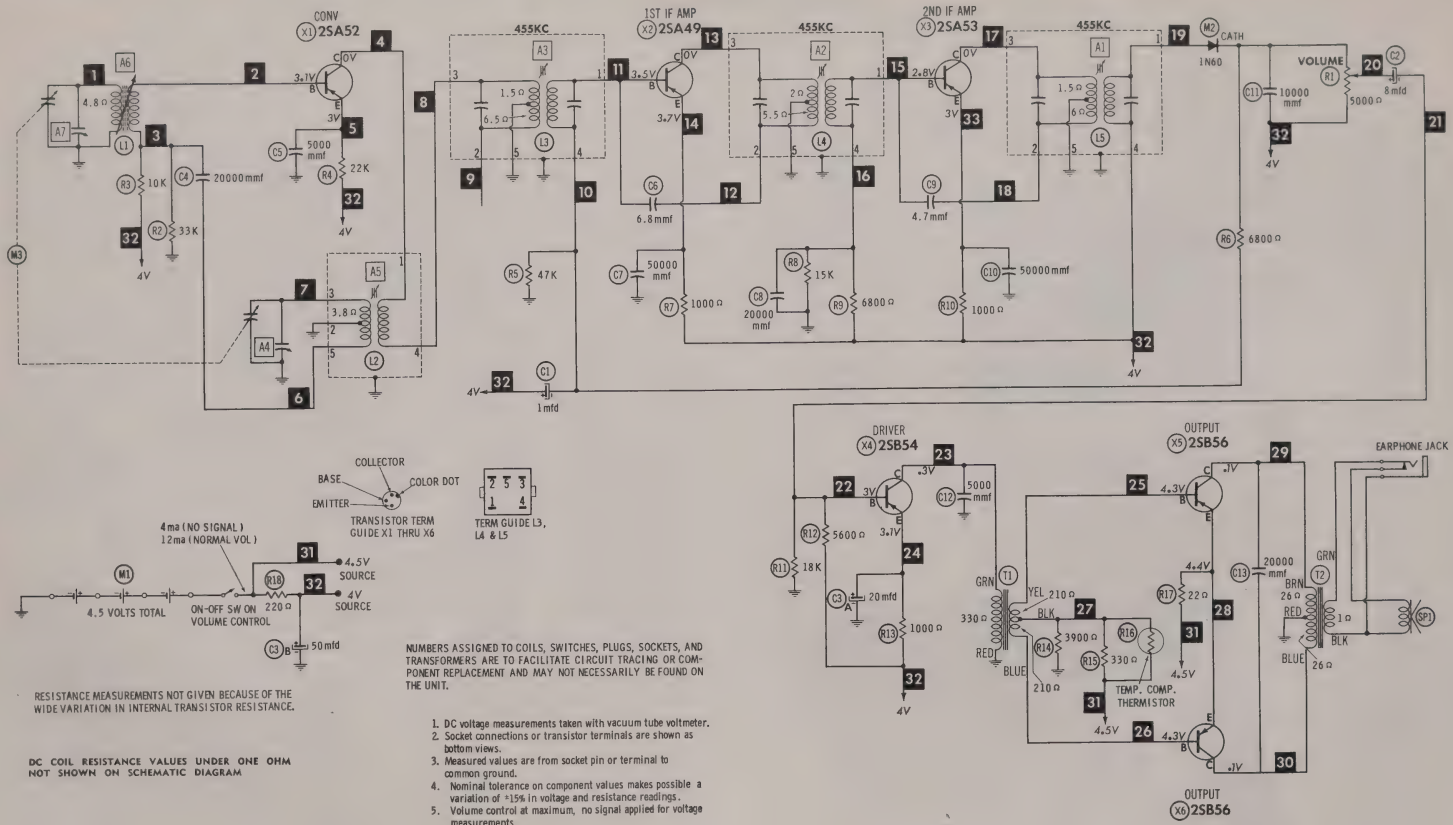
SET 538 FOLDER 15



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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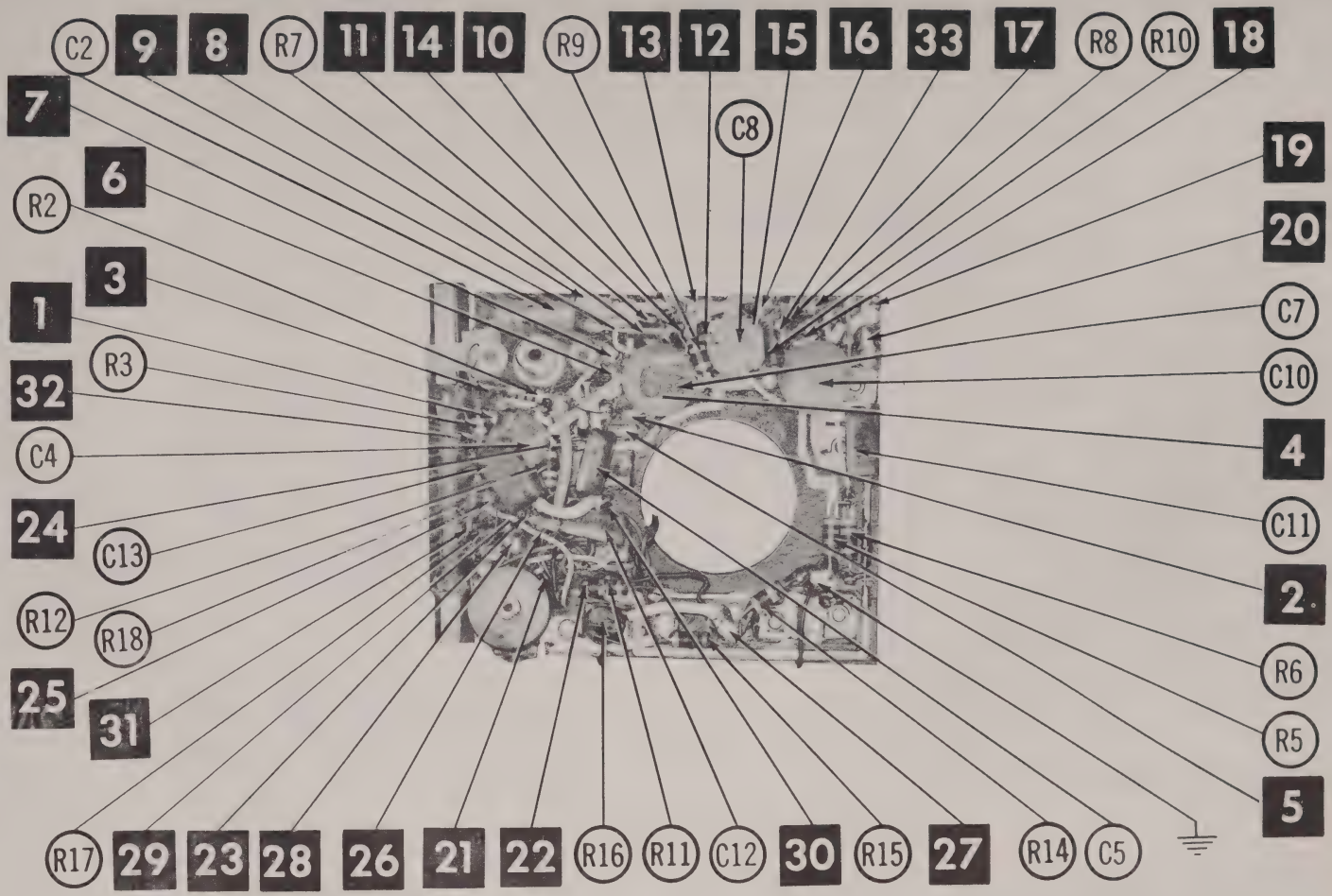
TOSHIBA
MODEL 6TP-394



A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

TOSHIBA
MODEL 6TP-394

FOLDER 15

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2SA52	Converter				PNP
X2	2SA49	1st IF Amplifier				PNP
X3	2SA53	2nd IF Amplifier				PNP
X4	2SB54	Driver	2N406			PNP
X5	2SB56	Output	2N408			PNP
X6	2SB56	Output	2N408			PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	TOSHIBA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	1	10			NLW1-50	TT12X1			
C2	8	5			NLW8-10				
C3A	20	5							
B	50	5							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20	
C5	5000		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50	
C6	6.8		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68	
C7	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50	
C8	20000		C80V203AM	DA-203	H-05S20		TA-120	TG-S20	
C9	4.7		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47	
C10	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50	
C11	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10	
C12	5000		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50	
C13	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TOSHIBA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/10	40573T	B16-214				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	33K				R11	18K			
R3	10K				R12	5600Ω			
R4	22K				R13	1000Ω			
R5	47K				R14	3900Ω			
R6	6800Ω				R15	330Ω			
R7	1000Ω				R16	Temp. Comp.			
R8	15K				R17	22Ω			
R9	6800Ω				R18	220Ω			
R10	1000Ω								

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		TOSHIBA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick						
L2	Osc.						
L3	1st IF						
L4	2nd IF						
L5	3rd IF						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	TOSHIBA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1	1	0415A			TR-38		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	TOSHIBA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	700Ω CT	6-8Ω	0482A					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TOSHIBA PART No.	QUAM PART No.	
SP1	2"	PM	6-8Ω	50114		

BATTERIES

ITEM No.	VOLTAGE	TOSHIBA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	UM-5 *		930 *		1015 *		M-15R *	* 3 Required

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		TOSHIBA PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60			1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	TOSHIBA PART No.	NOTES
M3	Tuning Cap.		2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

PHOTOFACT® Folder with CIRCUITRACE*

V-M MODEL
722

V-M MODEL
722

GENERAL INFORMATION

The V-M Model 722 is a two speed tape recorder with pushbutton controls for each mode of operation.

This recorder will record and play back both monaural and stereo tapes.

Any size reels up to 7" can be used. A magic eye recording tube is provided to simplify the recording level setting.

Recordings can be made from a radio, television receiver, or a phonograph.

The two speeds are 3 3/4 and 7 1/2 ips. Using all four tracks, the monaural playing time at 3 3/4 speed using a 7" reel is 4 hours. Using the 7 1/2 speed with a 7" reel, the playing time is 2 hours. Four track stereo at 3 3/4 speed is 2 hours and 1 hour at the 7 1/2 speed.

This recorder is to be operated at 115 volts, 60 cycle AC supply only.

Manufactured By:

V-M Corporation
Benton Harbor, Michigan

SET 538 FOLDER 16

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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CQ460

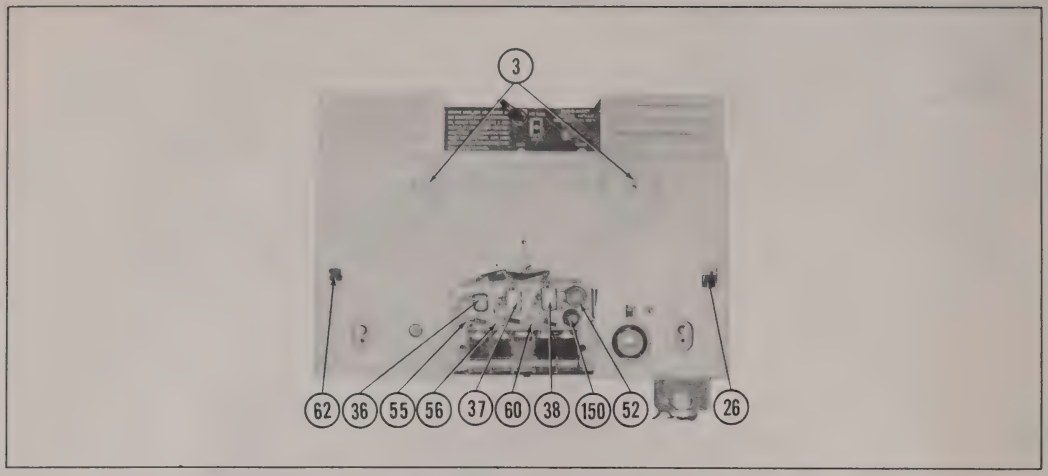


Fig. 1. Recorder with Escutcheons Removed.

PREVENTIVE MAINTENANCE

Cleaning

To insure top performance of your recorder, regular cleaning at frequent intervals is recommended.

During normal operation oxide is loosened from the tape and builds up on the heads, guides, pressure roller and capstan. This can cause poor playback response, weak recordings, distortion, and weak erase. It could cause the tape to travel up or down between the pressure roller and capstan.

To clean your recorder:

1. Depress the stop button.
2. Remove the speed control knob (4) by pulling it straight up.
3. Remove the two head escutcheon screws (5).
4. Lift off head escutcheon (6) exposing the heads, capstan and pressure roller.
5. Clean the surface of the heads and tape guides with a cotton swab moistened with alcohol or other recommended cleaner.
6. Use a cloth moistened with alcohol to clean capstan (150) and pressure roller (52).

Pressure Pads

The pressure pads can accumulate loose oxide because they press directly on the tape. As the oxide builds up in the felt pads, hard spots form that can cause a squeal as they rub against the back of the tape.

Pressure pads can be kept in good condition by first cleaning with alcohol and then roughing the nap of the felt with a fingernail file. If this does not eliminate the squeal, replace the pressure pad.

Head Demagnitizing

Record and playback heads acquire residual magnetism in normal operation because of overloading the head while recording. Using magnetized tools such as screwdrivers and wrenches near the heads must be avoided since this will also magnetize the heads. Heads that have become magnetized will show a definite loss of high frequency response when previously recorded tapes are played back, and an increase in noise level and distortion will be noticed in new recordings.

It is highly recommended that record and playback heads be demagnetized regularly to remove any residual magnetism. Follow instructions included with the demagnetizing unit.

Tape Care

To obtain the best results from your recorder and preserve your recordings, selection of tape and care of tape are important. The following suggestions will help in building and maintaining a quality tape library.

1. Always store tapes in a cool, dry place.
2. Always store tape reels in the vertical position to avoid warping the reels.
3. Do not store tape near electrical appliances that are equipped with motors or electrical coils.
4. Tapes that have become stretched through use cannot contact the heads or tape guides properly and should be replaced.
5. Use a quality commercial tape lubricant to relubricate tape that may become dry. Lack of lubrication causes harmful friction which results in wow, flutter, squeal, and head and guide wear.
6. Use only premium 1 1/2 mil or 1 mil thickness tape.

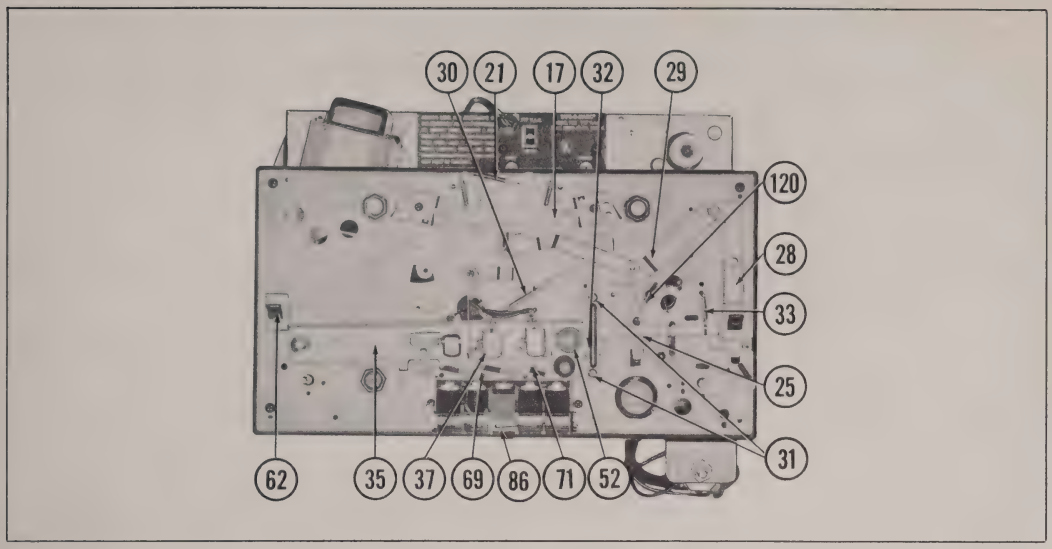


Fig. 2. Tape Transport Assembly, Top View.

MECHANICAL ADJUSTMENTS

Head-Bar Bracket

Adjust head-bar bracket (32) by turning screws (31) so that head bar (35) moves freely without binding. If the bracket is too loose, pressure roller (52) will not press against the capstan evenly, causing the tape to climb or to flutter.

Play and Record Torque

Take-up torque in Play and Record positions should be 1 3/4 to 2 1/2 ounces, measured 3 inches from the center of the takeup reel. To adjust, loosen the screw (102) on slide (120). Move the slide toward front of machine to increase the torque, toward back of machine to decrease the torque.

Release Wire

Adjust takeup bar release wire (119) so that the belt is applying no drag to the right takeup reel pulley when the unit is in Rewind. To adjust, bend the "Z" portion of the wire to lengthen or shorten the wire. If too much drag is applied, there will be no rewind.

Stop Adjustment

Bend stop button lever (86) at the point where the brake activating hook connects, so that the brakes release the reel discs when another button is depressed. When the stop button is depressed, bell crank (34) must disengage capstan idler (127) from the motor shaft and from the flywheel and capstan assembly (150).

Pressure Roller

The pressure roller stud must be parallel with capstan; otherwise, the tape will creep up or down the capstan. As a check, remove the "C" washer (50) from pressure roller (52). Raise the pressure roller slightly, and depress the play button. If the pressure roller rides up or down on the shaft, straighten the stud by slipping a close-fitting sleeve over it and bending it slightly.

The pressure roller pressure should be 2 to 3 1/2 pounds against the capstan in the Record and Play positions. To adjust the pressure, bend button levers (86) at the point where head bar activating springs (69 and 71) are hooked. Bend the tab in to decrease the pressure, out to increase the pressure.

Rewind Torque

Rewind torque should be 3 ounces measured 3 inches from the center of the rewind reel. If the torque is low, make sure rewind driver (146) is not slipping on takeup driver (144). Clean the drivers and rewind belt (147) of any oil or grease.

Pause Brake

With tape threaded on the machine and the play button depressed, bend the tab (see point A on Exploded View) on pause control arm (29) so that takeup driver (144) is released from the motor pulley and the pressure roller (52) is released from the capstan simultaneously. With the pause button locked in On position there should be no contact between the takeup driver (144) and the motor pulley.

Head Height

Remove the speed control, tone, brilliance, and volume control knobs, timer dials, and both escutcheons. Adjust the heads as follows:

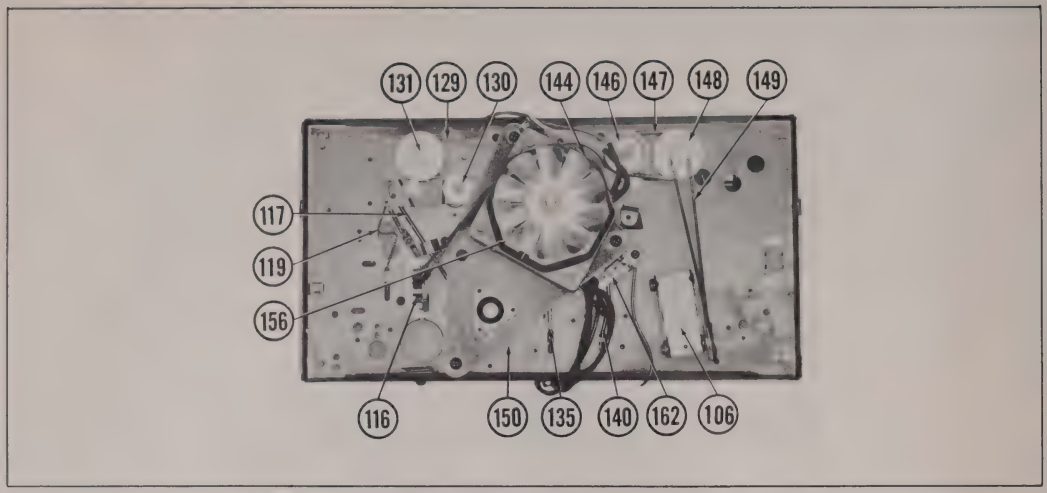


Fig. 3. Tape Transport Assembly, Bottom View.

QUARTER TRACK RECORD/PLAY HEAD

Adjust the quarter track record/play head (center head) by one of the following methods:

1. Visual Adjustment - Loosen the head mounting nuts (41). Adjust the head height so that the top of the top pole piece is even with the top edge of the tape. (See Fig. 4). As a check, use an unrecorded tape to record a signal on track 1. Rewind the tape. Then record a signal on track 3. Next, reverse the tape reels, but leave the Track Selector switch in the track 3 position. Play back the empty channel (channel 2), and listen for any signal on this track. No signal should be heard.

2. Prerecorded 4-Track Tape - Using a prerecorded 4-track tape, adjust the head height until the output is maximum on both channels. Reverse the tape reels. Then play back the tape. There should be no cross-talk between channels. The same recording check (with a blank tape) described in Method 1 can also be made here.

3. Special Height-Adjustment Tape (Part of VM 1046A) - Connect an AC voltmeter across the stereo-output receptacle. Place the Track Selector switch in the Four-Track Stereo position. Thread the tape. Then loosen the head mounting nuts. Raise the head as high as possible in the head nest. Depress the play button, and slide the head down until the output voltage increases beyond the normal noise level of the stereo preamplifier (but not more than 0.1 volt above this level). This method is more accurate than the others, because the top of prerecorded signal is 0.070" from the bottom of the tape. When the lower pole piece picks up a trace of this signal, the head height is set accurately.

It is possible to use an external amplifier-speaker system instead of the AC voltmeter. However, some of the accuracy may be lost since this would be a listening check.

ERASE HEAD

Adjust the height of the erase head (left head) so that the top of the pole piece is barely visible (0.005") above the top edge of the tape. (See Fig. 4).

HALF-TRACK PLAY HEAD

Adjust the stacked half-track stereo head (right head) so that the top of the top pole piece is even with the top of the tape. (See Fig. 4).

Head Azimuth

The azimuth of the 1/4-track and 1/2-track stereo heads is very important because it allows the maximum high-frequency response to be obtained from a prerecorded tape.

To adjust, load the recorder with a specially recorded azimuth or prerecorded tape. With the unit in Play position, adjust the front mounting nut (43) of each head for maximum high-frequency response.

Improper azimuth does not mean the recorder will not operate. There should be no difference between the response of a tape when recorded and played back on the same machine. However, when a tape is recorded on one machine and played back on a machine with an improperly set head, the loss of high-frequency response will be quite noticeable.

The azimuth of the erase head is not particularly critical. Adjust by bending the mounting bracket until the head appears to be vertical.

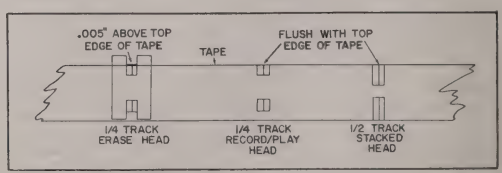

.005" ABOVE TOP EDGE OF TAPE
TAPE
FLUSH WITH TOP EDGE OF TAPE
1/4 TRACK ERASE HEAD
1/4 TRACK RECORD/PLAY HEAD
1/2 TRACK STACKED HEAD

Fig. 4. Relationship Between Heads and Tape.

ELECTRICAL ADJUSTMENTS

NOTE: Make all measurements and adjustments with track selector switch in Four Track Stereo position. The amplifier and transport mechanism will have to be removed from the case, except where otherwise noted.

Eye Sensitivity

1. Disable the bias oscillator by removing tube V8 (12AU7A).
2. Set track selector switch to Four Track Stereo position. Push down record button.
3. Remove the head escutcheon and unsolder the two white leads from the center record/playback head.
4. Set the output of an audio generator for .0015 volt at 400 cps. Connect it to the Channel A input jack.
5. Connect a 100Ω, 5% resistor, across the terminals of an audio VTVM. Connect the VTVM leads in series with the white lead of the upper head element. Adjust main volume control (outer knob) for a reading of .0045 VAC on the VTVM.
6. Remove accessory compartment cover for access to eye sensitivity controls.
7. Adjust main eye sensitivity control (R 3) so that left image on eye tube just closes but does not overlap.
8. Repeat above procedure for Channel B, applying audio signal to Channel B input jack, and connecting the audio VTVM in series with the white lead of the lower head element. Adjust the Stereo Record control (inner knob), and the stereo eye sensitivity control (R 4) so that the right image on eye tube just closes but does not overlap.

Bias

The bias current to the head must be set correctly to insure proper recording characteristics. Adjustment should not be attempted without proper test equipment.

1. Set track selector switch to Four Track Stereo position. Push down record button.
2. Remove the escutcheon and unsolder white lead from top head element of center record/playback head.
3. Connect a 100Ω, 5% non-inductive resistor across terminals of an audio VTVM. Connect VTVM leads in series with upper head elements. Set speed control knob to 7 1/2 ips. Adjust Chan. A bias trimmer (29A) for a reading of .038 volts (0.38ma current).
4. Repeat above procedure for Channel B, connecting the audio VTVM in series with the lower head element and adjusting bias trimmer (C29B) for a reading of .038 volts (0.38ma current).

RF Trap

To adjust the RF trap (L1) for Channel A, connect an audio VTVM across the external speaker jack, and have nothing connected to the input jack. Turn Volume and Brilliance controls to maximum (fully clockwise). Adjust RF trap (L1) for minimum reading on meter.

Repeat same procedure for Channel B, connecting audio VTVM to Channel B output jack, and adjusting L2.

Hum Balance

Hum balance controls are located on the rear of the amplifier chassis and can be easily adjusted without removing the unit from the case. The controls are marked "MAIN" for Channel A and "STEREO" for Channel B.

Turn the Volume and Tone controls to maximum, and adjust hum balance controls R5 and R6 for minimum hum. Try the AC line-cord both ways. If hum is still excessive, the power transformer may need repositioning. Repositioning of the power transformer and adjustment of the hum balance controls should be done several times until minimum hum level is obtained. The hum balance controls may be adjusted without removing the unit from the case. However, to reposition the transformer, removal from the case is necessary.

LUBRICATION

Lubricants applied during manufacture last for a long time. Approximately once a year, or if parts are replaced, lubricate as follows:

Apply S. A. E. 10-30 motor oil to:

1. Both capstan bearings. To oil the capstan bearings, place a small drop of oil on each bearing.

   CAUTION: Be sure no oil is on the portion of the capstan extending above the base plate.

2. Tension pulley (130) bearings.
3. Reel disc bearings (107).
4. Rewind driver (146) bearing.
5. Capstan idler (127) bearing.
6. Take-up driver (144) bearing.
7. Pressure roller (52) bearing.

NOTE: When oiling any bearing in which a rubber part is mounted, or a part using a belt, apply only one small drop of oil. Oil and grease must be kept off all idlers, belts, the rim of the flywheels, and off all parts that might transfer oil or grease to them.

Apply Trojan "H2" grease:

1. Between brake arm (17) and brake shoes.
2. Between brake shoes and base plate.
3. Between rewind arm (141) and base plate.

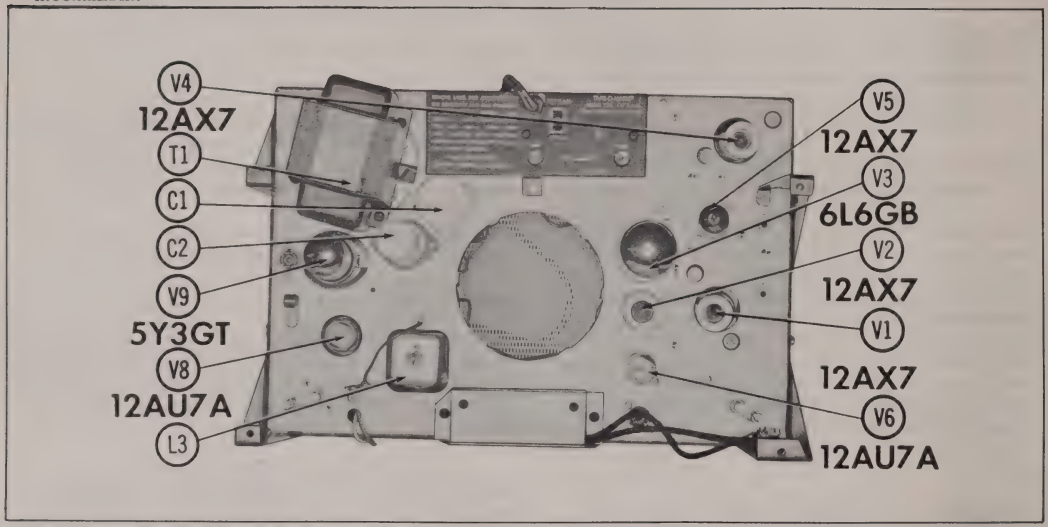
4. Under head bar (35) pivot bosses.
5. Top of head bar (35) above R. H. bosses.
6. Between take-up bar (122) and base plate.
7. Between pause lever (28) and base plate.
8. Between bell crank (134) and base plate.
9. To latch bar (81) on cam side, where button levers (86) make contact.
10. To latch bar (81) and button housing (88) pivot holes.
11. To brake rod (135) ends at base-plate holes.
12. To rewind rod (140) at base-plate hole.
13. To fast-forward rod (117) at take-up bar (122) slot.
14. To holes in base plate where amplifier switch extensions slide.

DISASSEMBLY INSTRUCTIONS

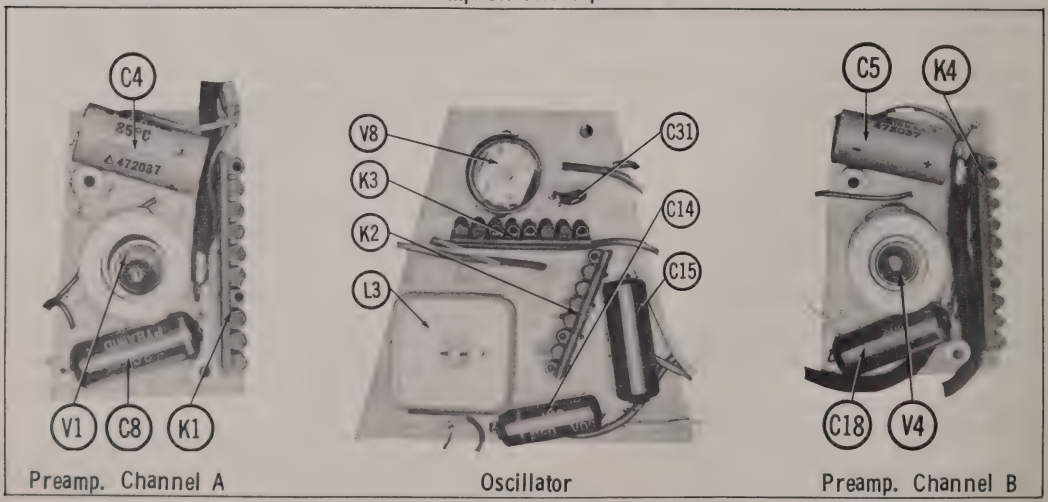
To Remove Amplifier and Transport Mechanism from Case

1. Remove one mounting screw from each side of case.
2. Place the unit bottom side up on a soft pad and remove screws inside the four rubber feet.
3. Lift case part way off of amplifier and transport mechanism.
4. Unplug speaker and pilot light cable assembly from amplifier chassis.
5. Lift off case and set aside.

NOTE: Follow the above procedure to expose the speakers in the case for removal or servicing.

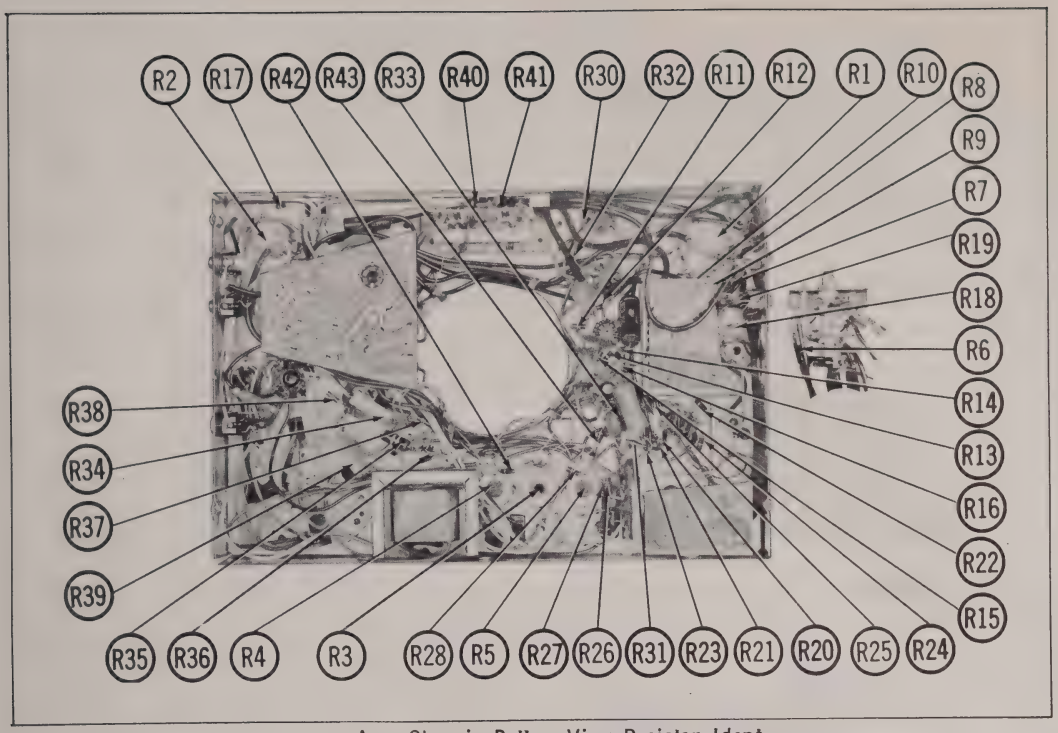


Amp Chassis-Top View

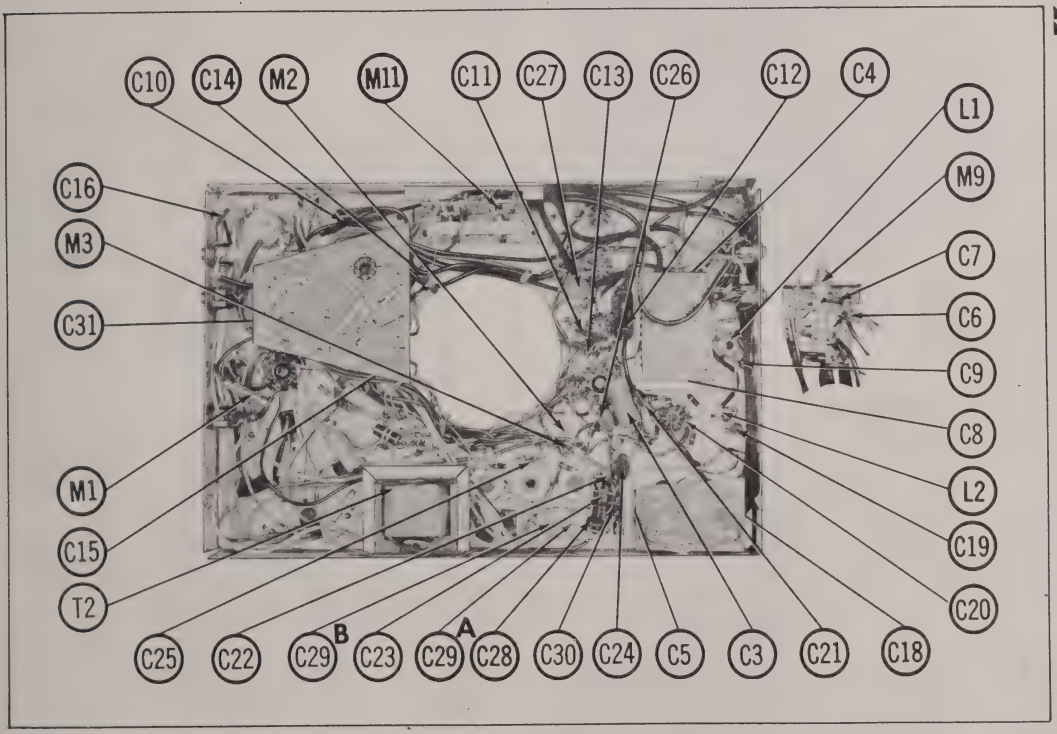


Preamp. Channel A | Oscillator | Preamp. Channel B

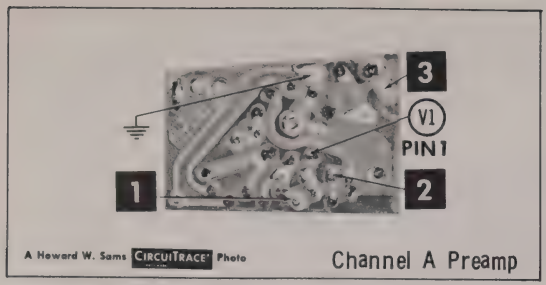
Printed Boards

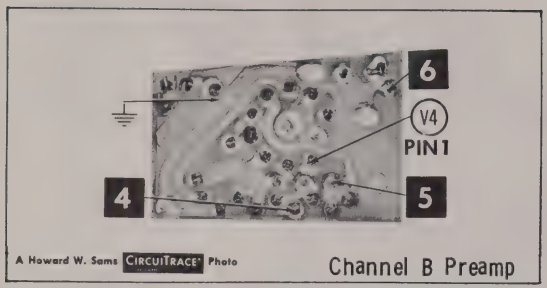


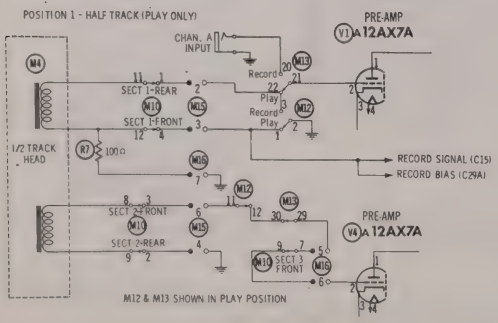
Amp Chassis Bottom View-Resistor Ident.

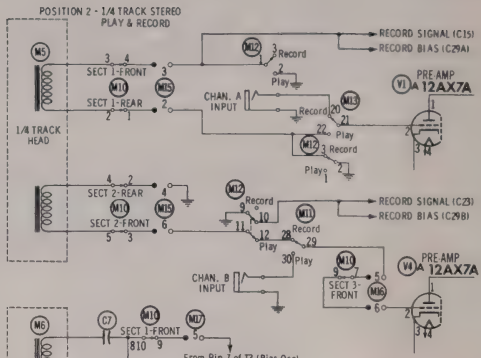


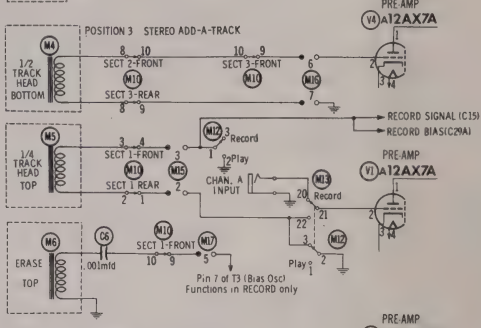
Amp Chassis Bottom View-Capacitor, Inductor & Misc. Ident.

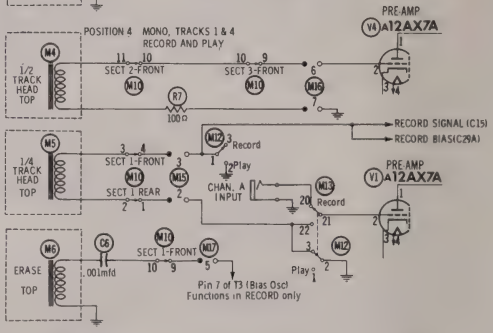


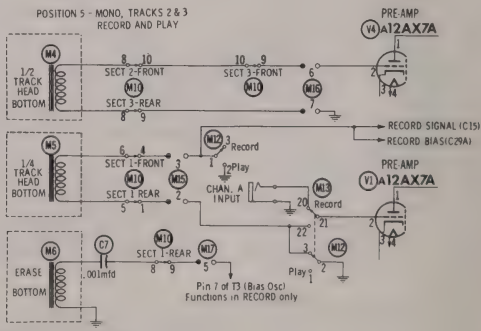




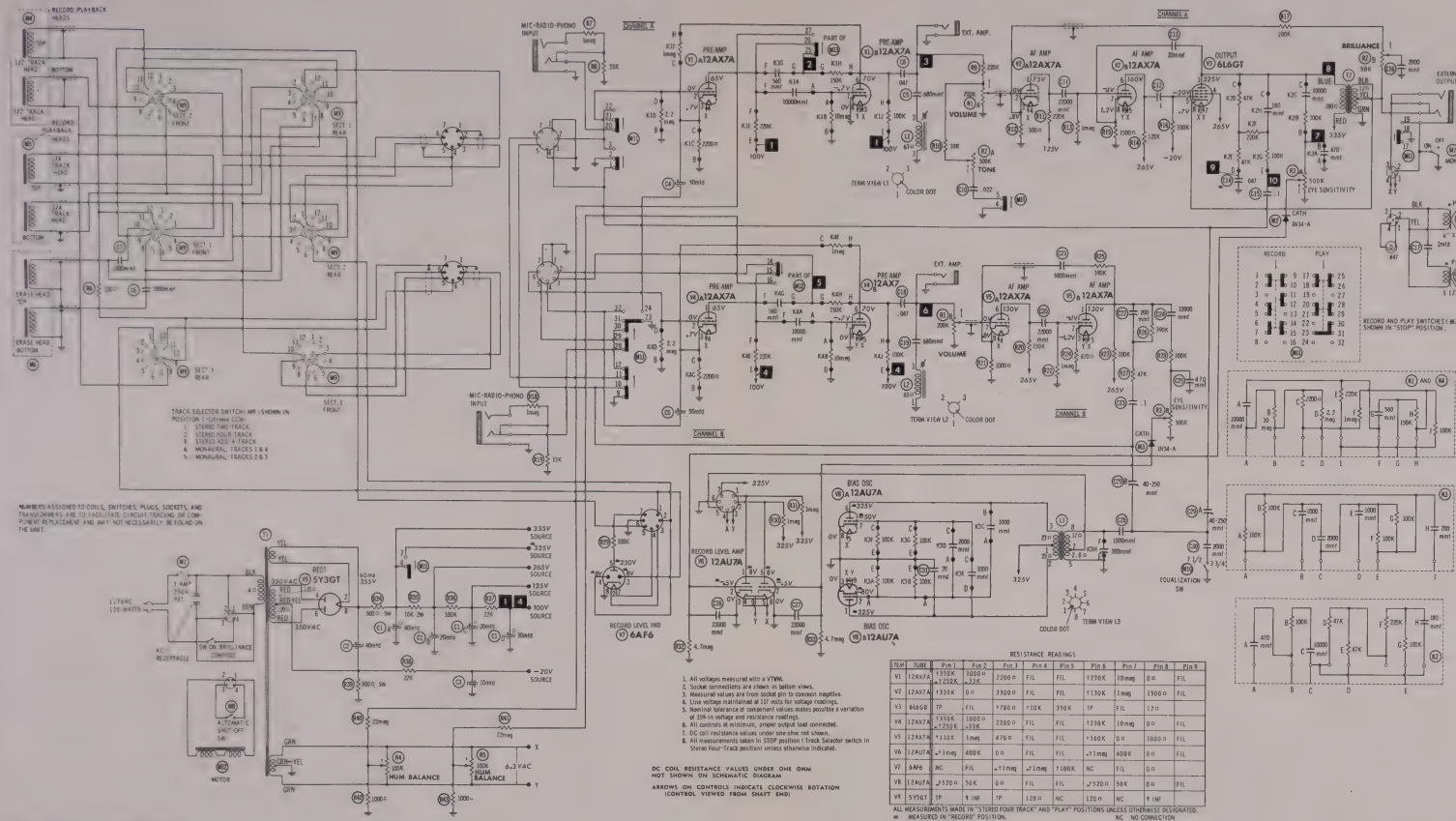








Simplified Partial Schematic.



1. All voltages measured with a VTVM.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of 10% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.
7. DC coil resistance values under one ohm not shown.
8. All measurements taken in STOP position 1 Track Selector switch in Stereo Four-Track position) unless otherwise indicated.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
12AX7A	135Ω / 125K	220Ω / 33K	FIL	FIL	230K	10meg	0Ω	FIL	
12AX7A	330K	0Ω	390Ω	FIL	FIL	130K	1meg	1500Ω	FIL
6AQ8	TP	FIL	780Ω	10K	350K	TP	FIL	12Ω	
12AX7A	135K / 125K	160Ω / 33K	220Ω	FIL	FIL	230K	10meg	0Ω	FIL
12AX7A	110K	1meg	470Ω	FIL	FIL	160K	0Ω	160Ω	FIL
12AU7A	1meg	400K	0Ω	FIL	FIL	.1meg	400K	0Ω	FIL
6AF6	NC	FIL	1meg	1meg	100K	NC	FIL	0Ω	
12AU7A	520Ω	50K	0Ω	FIL	FIL	520Ω	50K	0Ω	FIL
5Y3GT	TP	INF	TP	120Ω	NC	120Ω	NC	INF	

ALL MEASUREMENTS MADE IN "STEREO FOUR TRACK" AND "PLAY" POSITIONS UNLESS OTHERWISE DESIGNATED.
∞ MEASURED IN "RECORD" POSITION. NC NO CONNECTION
* MEASURED FROM PIN 8 OF V9. TP TIE POINT
† THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
CIRCUITRACE
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V-M MODEL 722

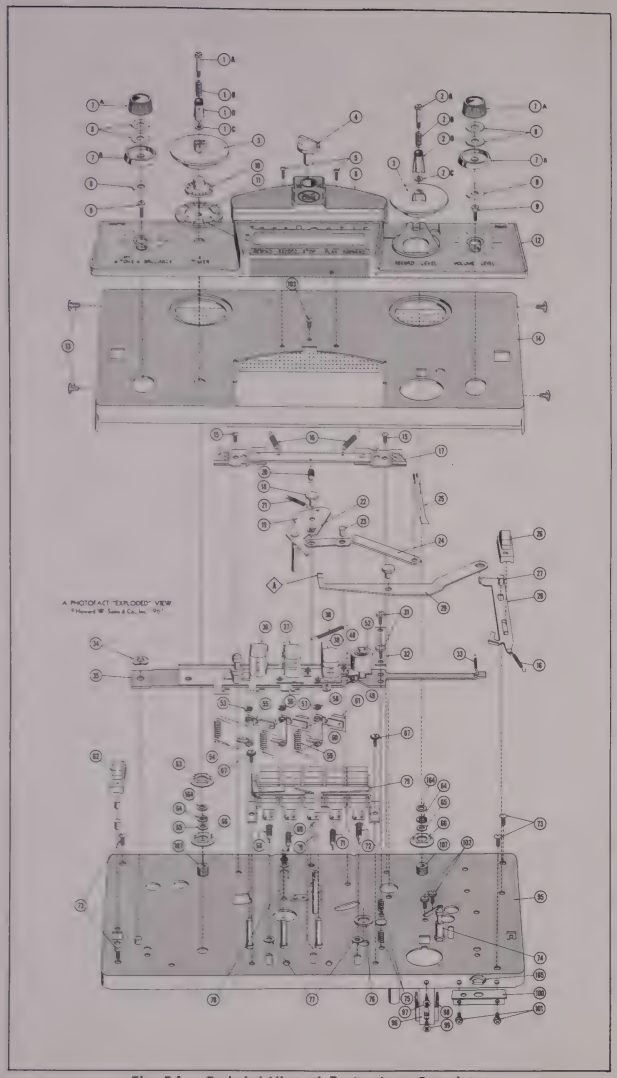


Fig. 5A Exploded View of Parts above Baseplate

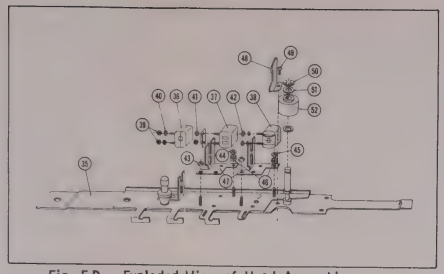


Fig. 5B Exploded View of Head Assembly

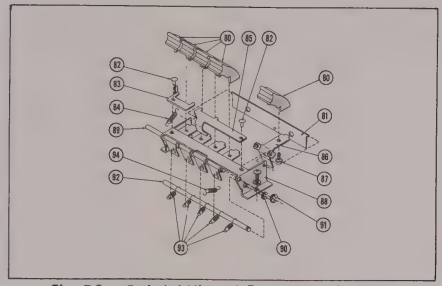


Fig. 5C Exploded View of Pushbutton Assembly

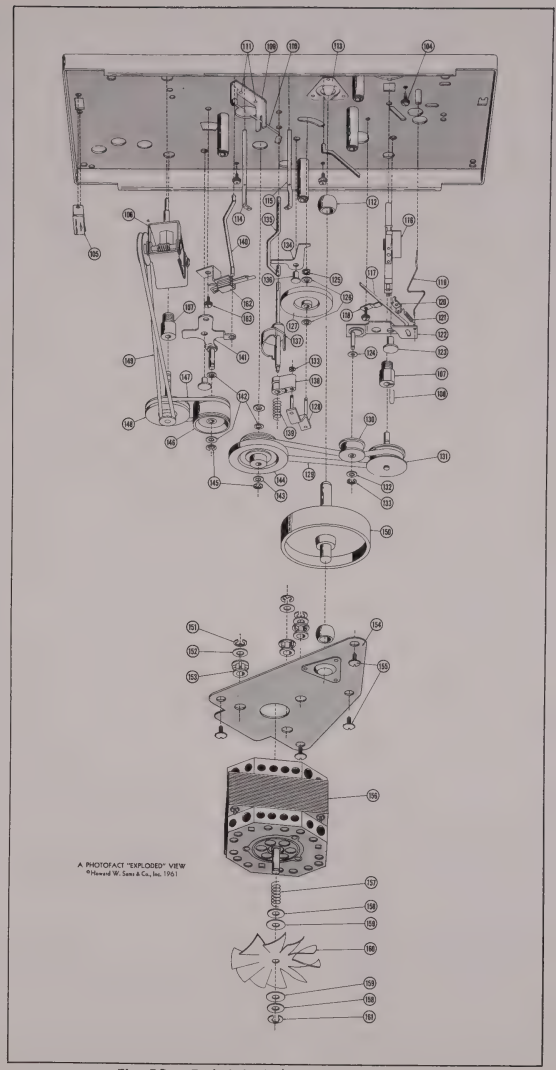


Fig. 5D Exploded View of Parts below Baseplate

TROUBLE CHART

Symptom	Cause	Remedy
Take-up reel does not revolve in Play or Record position.	1. Pause brake on or sticking.	1. Release pause brake; check that pause brake lever (28) is free and releases completely.
	2. Brakes (17) not releasing properly.	2. Check that brakes (17) are releasing completely; if not, adjust button lever (86) on Stop button.
	3. Take-up belt (129) stretched or worn.	3. Replace stretched or worn take-up belt (129).
	4. Take-up belt (129) off pulleys.	4. Pulleys must be aligned correctly. Otherwise, belt will continue to slip off.
	5. Capstan idler (127) not engaging flywheel.	5. Check that Speed Change button is in detent completely; also check that bell crank (134) is releasing capstan idler (127).
	6. Speed change not in detent completely.	6. Turn button to proper speed.
	7. Tension pulley (130) not engaging take-up belt.	7. Check that take-up arm (122) is not binding on base plate or fast forward rod (117), or that spring (121) is not disconnected, or that proper adjustment has been made.
	8. Pressure roller (52) applying too much pressure against capstan; stalling motor.	8. Adjust button lever (86) on Play and/or Record buttons so that pressure roller applies from 2 to 3 1/2 lbs. pressure on the capstan. (See "Mechanical Adjustments".)
	9. Head bar activating springs (69) or (71) off or broken.	9. Replace springs (69) or (71).
	10. Take-up driver (144) not engaging motor shaft.	10. Take-up arm (19) must operate freely.
Take-up reel does not revolve in Forward position.	1. Button lever (86) not adjusted properly.	1. Button lever can be adjusted to provide small deviations in torque. See "Mechanical Adjustments."
	2. Activating spring (20) loose or broken.	2. Replace activating spring (20).
	3. Take-up belt (129) off pulleys.	3. Replace (see "Take-up reel does not revolve in Play or Record position").
	4. Take-up belt (129) worn.	4. Replace take-up belt (129).
	5. Brake sticking on supply-reel disc.	5. Check that brake return springs are releasing brakes.
	6. Too much friction in counter (106).	6. Counter should turn freely without binding.
	7. Tension pulley (130) not engaging take-up belt.	7. Check that take-up bar (122) is not binding on base plate or take-up rod (117).

TROUBLE CHART (CONT'D.)

Symptom	Cause	Remedy
Reels do not stop when Stop button is depressed.	1. Button lever (86) not adjusted properly.	1. Button lever must be adjusted to release the brakes completely when another button is depressed.
	2. Brake activating hook (70) or spring (20) loose or broken.	2. Replace hook (70) or spring (20).
	3. Brake assembly binding.	3. Check to see if brake assembly operates freely.
	4. Brakes worn.	4. Replace brake assembly (17).
	5. Take-up bar (122) not releasing.	5. Take-up bar must be released by the action of release wire (119) contacting the head bar.
Weak output.	1. Dirty heads.	1. Heads must be cleaned regularly. See "Preventive Maintenance."
	2. Playback head (37) not aligned properly.	2. Head should be aligned for maximum output. (See "Head Adjustments".)
	3. Pressure pad (57) not contacting head properly.	3. Pressure pad (57) should make complete contact with head pole piece.
	4. Light pressure-pad pressure.	4. Pressure pad must have from 12 to 18 grams pressure on head.
	5. Defective record head (37).	5. Replace record head (37).
Take-up reel revolves rapidly when Play or Record button is depressed.	1. Tab on pause control lever (29) not adjusted properly.	1. Adjust pause control arm (29) so that pressure roller (52) disengages capstan and take-up driver stops simultaneously.
	2. Head bar bracket (32) too tight.	2. See "Mechanical Adjustments".
	3. Button levers not adjusted properly.	3. Button levers (86) must be adjusted so that pressure roller (52) applies from 2 1/2 to 3 1/2 pounds pressure on capstan in Play or Record position. (See "Mechanical Adjustments".)
	4. Pressure roller (52) not aligned properly.	4. See "Mechanical Adjustments".
Supply reel does not revolve in Rewind position.	1. Loose reel shaft screw (1).	1. Tighten reel shaft screw (1).
	2. Rewind belt (147) off drive pulleys.	2. Replace rewind belt (147).
	3. Rewind torque not sufficient.	3. See "Mechanical Adjustments".
	4. Activating spring (20) loose.	4. Replace activating spring (20).
	5. Take-up driver (144) not engaging motor drive shaft.	5. See "Take-up Reel does not revolve in Play or Record position".
	6. Brake sticking on take-up pulley.	6. Check that brake-arm assembly is free and not binding; also check that brake return springs are releasing brakes.
	7. Pause brake on.	7. Release Pause brake.

TROUBLE CHART (CONT'D.)

Symptom	Cause	Remedy
	8. Oil on rewind belt (147).	8. Remove any oil from belt and pulleys.
	9. Release wire (119) not releasing tension pulley (130).	9. Readjust release wire (119). See "Mechanical Adjustments."
Does not shut off at end of tape.	1. Defective switch.	1. Replace or repair switch.
	2. Switch wand catching on plastic escutcheon (12).	2. Position switch by loosening self-tapping screw (104).
	3. Switch (116) wand deformed.	3. Repair or replace switch (116).
Wow or flutter (Record or Playback).	1. Bump on take-up belt (129).	1. Replace take-up belt (129).
	2. Safety switch (116) applying too much pressure on tape.	2. Replace safety switch (116).
	3. Brakes dragging.	3. (A) Adjust Stop button lever (86) so that brakes release completely. (B) Check that brake return springs (16) are not loose or broken. (C) Brake arm assembly must be free and not binding. (D) Pause brake must release completely.
	4. Flat or bumpy pressure roller.	4. Replace pressure roller.
	5. Capstan bearings not aligned properly.	5. Tap capstan slightly (bearings are self-aligning).
	6. Eccentric flywheel.	6. Replace flywheel.
	7. Bumpy or eccentric capstan idler (127).	7. Replace capstan idler (127).
	8. Head bar bracket loose.	8. See "Take-up reel revolves rapidly in Play or Record position".
	9. Pressure roller (52) not aligned properly.	9. See "Mechanical Adjustments".
Unit does not turn on with Off-On switch.	1. No current at motor or amplifier.	1. (A) Check that current is reaching AC leads. (B) Check that fuse is not burned out. If so, replace. (C) Check that Off-On switch and automatic shutoff switch are closing.
Button interlock (85) inoperative.	1. Interlock bar return spring loose or broken.	1. Replace spring.
	2. Buttons sheared.	2. Replace buttons.
	3. Tabs on interlock bar (85) bent.	3. Straighten or replace tabs. Tab on back of interlock bar must be set so that button lever on the Stop button can remove the interlock bar from under the Play and Record buttons.

TROUBLE CHART (CONT'D.)

Symptom	Cause	Remedy
Record button can be depressed without Safety lever.	1. Record interlock return spring off or broken.	1. Replace spring.
	2. Tabs on Record button interlock lever bent or broken.	2. Straighten or replace tabs.
	3. Button sheared.	3. Replace.
Buttons do not stay depressed.	1. Latch bar spring off or broken.	1. Replace latch bar spring.
	2. Latch bar sticking or bent.	2. Repair or replace latch bar.
Counter inoperative.	1. Counter belt (149) off pulleys.	1. Replace counter belt (149).
	2. Counter dial loose.	2. Repair or replace counter dial.
	3. Gears binding.	3. Counter must turn freely without binding. Check gears and pulleys for binding.
Does not erase cleanly.	1. Leads off erase head (36).	1. Replace leads.
	2. Erase head (36) not adjusted properly.	2. Erase head (36) should be adjusted so that top of head pole piece is approximately 0.005 inch above edge of tape. (See Fig. 4).
	3. Low erase current.	3. To determine the proper erase current, place a 100-ohm precision resistor in series with either lead from the erase head. Place the recorder in the Record position and, with an AC voltmeter, check the voltage across the resistor. When the oscillator and erase head are functioning properly, the voltage across the resistor should be approximately 1.8 volts. With a 1.8-volt reading, the required 18 milliamps of current are present.
Pause brake does not operate properly.	1. Tab on pause brake not adjusted properly.	1. See "Take-up Reel revolves rapidly when Play or Record button is depressed".
	2. Brakes worn.	2. Replace brakes.
Crosstalk (sound from two adjacent channels being heard at the same time).	1. Incorrect head height.	1. Adjust head height. See "Mechanical Adjustments.

Ref. No.	Part No.	Description
1A	15928	Screw, Left Hand
B	15925	Spring, Reel
C	15926	Washer
D	15929-CM	Reel Hold Down
2A	15927	Screw, Right Hand
B	15925	Spring, Reel
C	15926	Washer
D	15929-CM	Reel Held Down
3	15914-CM	Reel Disc (2 req'd)
4	8140-A22	Knob, Speed Control
5	8256-B	Screw, Head Escutcheon
6	8118-C	Head Escutcheon
7A	15722-C	Knob (Outer) (2 req'd)
B	15723-C	Knob (Inner) (2 req'd)
8	6990	Washer, Felt (6 req'd)
9	8407	Screw, (2 req'd)
10	15637-A	Counter Dial, Small
11	15636-A	Counter Dial, Large
12	8939-C	Main Escutcheon
13	8214	Stud, Tri-Mount (4 req'd)
14	16175-CM	Cover Plate Assembly
15	8296	Screw, Brake Arm (2 req'd)
16	8138	Spring (3 req'd)
17	8297	Brake Arm Assembly
18	8567	Shoulder Rivet
19	15873	Takeup Arm Assembly
20	8441	Spring, Activating
21	15775	Spring, Takeup
22	8199	Washer, Fibre
23	8037	Rivet
24	8293	Lever, Switch Release
25	8294	Release Wire
26	8048-A46	Pause Button
27	4092	Rivet
28	8044	Lever, Pause
29	15919	Control Arm, Pause
30	8078	Spring, Idler Return
31	8152	Screw (2 req'd)
32	8147	Head Bar Bracket
33	8138	Spring, Head Bar Return
34	8520	Spring Washer
35	8593	Head Bar & Plate Ass'y
36	12630	Erase Head (Alternate Part No. 12593, 12586)
37	12585	Record/Play Head (Alternate Part No. 12595)
38	12548	Play Head (Alternate Part No. 12607)
39	2300	Hex Nut (2 req'd)
40	8424	Washer (2 req'd)
41	2300	Hex Nut (2 req'd)
42	2300	Hex Nut (2 req'd)
43	2300	Hex Nut (2 req'd)
44	2300	Hex Nut
45	2300	Hex Nut
46	8131	Spring, Head Nest (2 req'd)
47	8023	Head Nest (2 req'd)
48	8045	Tape Guide
49	8175	Screw, Tape Guide
50	8489	"E" Ring
51	8266	Washer, Fibre (2 req'd)

Ref. No.	Part No.	Description
52	8123	Pressure Roller
53	15844	"E" Ring
54	15716	Spring, Pressure Pad Arm
55	8393	Pressure Pad, Erase
56	15800	Pressure Pad, Record/Play
57	15801	Felt Pressure Pad
58	15844	"E" Ring
59	15716	Spring, Pressure Pad Arm
60	15800	Pressure Pad Ass'y, Play
61	15801	Felt Pressure Pad
62	8048-A46	Monitor Button
63	8398	Pal Nut, Counter Mtg.
64	8489	"E" Ring (2 req'd)
65	2583	Washer, Fibre (2 req'd)
66	8398	Pal Nut (2 req'd)
67	8298	Screw, Push-Button Mtg. (2 req'd)
68	8173	Spring, Activating
69	8174	Spring
70	8285	Activating Hook
71	15972	Spring
72	15908	Spring
73	8608	Screw (4 req'd)
74	8050	Tape Stud
75	8434	Spring (2 req'd)
76	8031	Dust Shield
77	2274	Washer (2 req'd)
78	15550	Tape Release Wire
79	16047-H	Push-Button Ass'y (Complete)
80	8702-A22	Button, Brown
	8702-A10	Button, Red
81	8082	Latch Bar
82	8037	Rivet (2 req'd)
83	8432	Lever, Interlock
84	8128	Spring, Interlock Lever
85	8114	Interlock Bar
86	8024	Button Lever
87	8256-A	Screw, Button Mtg.
88	8382	Button Housing Ass'y
89	8089	Rod, Button Lever
90	8489	"E" Ring
91	15844	"E" Ring
92	8116	Stop Rod
93	8125	Spring (5 req'd)
94	8128	Spring, Latch Bar
95	16170	Baseplate Assembly (Includes permanently fixed parts)
96	16103	Bracket, Eye Tube
97	8608	Screw, Eye Tube Bracket
98	8795	Clamp, Eye Tube
99	8961	Screw, Eye Tube Clamp
100	16037	Bracket, Track Selector Switch
101	8298	Screw, Switch Bracket (2 req'd)
102	8475	Screw (2 req'd)
103	8256-B	Screw, Cover Plate
104	8298	Screw, Tape Stud
105	8220	Switch, Monitor

MECHANICAL PARTS LIST (Continued)

Ref. No.	Part No.	Description
106	8046	Counter Assembly
107	15902	Bearing (2 req'd)
108	15917	Spring, Reel Drag, R.H.
109	S8076	Guide, Cam Link Spring
110	8040	Spring, Cam Link
111	94	Rivet, Guide Mtg. (2 req'd)
112	8084	Capstan Bearing
113	21012	Plate, Capstan Bearing
114	16095	Extension, Record Switch
115	16096	Extension, Playback Sw.
116	15865	Safety Switch
117	8121	Rod, Fast Forward
118	8107	Guide, Control Rod
119	15918	Takeup Bar Release Wire
120	2934	Slide, Takeup Adjust.
121	8138	Spring
122	16061	Takeup Bar Assembly
123	8331	Rivet
124	8568	Washer, Cork
125	15844	"E" Ring
126	2829	Washer, Fibre (2 req'd)
127	8079	Capstan Idler
128	S8391	Pivot Arm, Capstan Idler
129	8034	Takeup Belt
130	8103	Tension Pulley & Bearing Assembly
131	15761	Reel Shaft Ass'y R.H.
132	8568	Washer, Cork
133	15844	"E" Ring (2 req'd)
134	8014	Bell Crank
135	15872	Brake Rod
136	8037	Rivet
137	8039	Cam and Shaft Assembly
138	S8029	Cam Link

Ref. No.	Part No.	Description
139	8535	Spring, Cam Link Lift
140	8035	Rewind Rod
141	8973	Rewind Arm Assembly
142	2583	Washer, Fibre (3 req'd)
143	8566	Washer, Cork
144	15774	Driver, Takeup
145	8489	"E" Ring (2 req'd)
146	8106	Rewind Driver
147	8063	Rewind Belt
148	15762	Reel Shaft Ass'y L.H.
149	8141	Counter Belt
150	8110	Flywheel & Capstan Ass'y
151	8489	"E" Ring (3 req'd)
152	8373	Washer (3 req'd)
153	15828	Motor Mtg. Grommet
154	16053	Subplate Assembly
155	8146	Screw (4 req'd)
156	8015	Motor (Alt. Part No. 16038 &
157	8258	Spring 16154)
158	2279	Washer (2 req'd)
159	7470	Washer, Cork (2req'd)
160	8255	Fan
161	1719	"C" Washer
162	15937	Equalization Switch and Bracket
163	8298	Screw, Equal. Switch
164	6515	Washer, Metal
165	16858	Pal Nut

PARTS NOT CALLED OUT

8945	Speed Nut
8917	Bracket, Cover Plate
8685	Scratch Shield
15867-B	Chassis Cover Ass'y
8611	Conversion Kit for 110V 50 cycle operation

ELECT. PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel A Preamp.	12AX7A	V6	Record Level Amp.	12AU7A
V2	Channel A AF Amp.	12AX7A	V7	Record Level Ind.	6AF6
V3	Channel A Output	6L6GB	V8	Bias Osc.	12AU7A
V4	Channel B Preamp.	12AX7A	V9	Rectifier	5Y3GT
V5	Channel B AF Amp.	12AX7A			

GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	▲40	450	12045	AFH4-92-50	D0606	XC4-55	FP433.4	TMQ-4604	TVL-4758.4
B	20	450							
C	▲20	300							
D	■30	300							
C2	40	450	12044	AFH1-52	A0480	XC1-3	FP146	TMS-1770	TVL-1725
C3	10	25	12046	PRS1250	BBR10-25	QT1-5	TC22	TD-10-25	TVA-1204
C4	50	6	12061	PRS1265	BBR50-6	QT1-15	TC29	TD-50-6	TVA-1100
C5	50	6	12061	PRS1265	BBR50-6	QT1-15	TC29	TD-50-6	TVA-1100

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.001 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C7	.001 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C8	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C9	680		DI-680	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C10	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C11	.022		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C12	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C13	20		DI-20	DD-200	L10Q20	CCD-200	GP420	10TS-T20
C14	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C15	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C16	.002		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C17	2.0 100V	#12069	P292ZN-2.0		WMF1W2E			
C18	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C19	680		DI-680	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C20	.022		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C21	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C22	200		DI-200	DD-201	L10T2	CCD-201	GP320	10TS-T20
C23	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C24	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C26	.022		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C27	.022		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C28	.001 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C29A	40-250	#12176				464		
B	40-250					464		
C30	.002 10%		DI-2000		5R5D2	CCD-202	GP220	10TS-D20
C31	20 NPO		NPO-DI 20	DTZ-20	C10Q20C	CCTO-200	CNO-422	10TCC-Q20

V-M Part Number.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	200K		12440				■UE4221	Volume, Channel A
B	200K							Volume, Channel B
R2A	500K		12344				▲UE3843-S	Tone, Channel A
B	50K							Brilliance, Channel A
C	Switch							Power Off-On
R3A	500K		12441	F1-40		† QJ-1539R	▲ UE4222	Eye Sens., Channel A
B	500K			R2-40				Eye Sens., Channel B

CONTROLS (cont)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R4A	100K	½	12408	TT-40	B47-100K-S	B11-128	PTA15L	Hum Balance, Channel A
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R5A	100K	½	12408	TT-40	B47-100K-S	B11-128	PTA15L	Hum Balance, Channel B
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	

† "CONCENTRIKIT" Equivalent: K-8 Kit with Base Elements and Shafts:
(Not available as a factory assembled unit) B11-133, P19-012 (Panel)
B11-133, R15-005 (Rear)
R5 (Retainer)

■ "STA-LOC" Equivalent: FA254A, RU254A, OS5250, IS5750
▲ "STA-LOC" Equivalent: FB55A, RU54A, OS5250, IS5750, US41
▲ "STA-LOC" Equivalent: FB55L, RU55L, OK500, IK525

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R6	100Ω			
R7	1meg			
R8	33K			
R9	220K			
R10	10K			
R11	220K			
R12	3300Ω			
R13	1meg			
R14	120K			
R15	1500Ω			
R16	330K			
R17	100K			
R18	1meg			
R19	33K			
R20	150K			
R21	1000Ω			
R22	1meg			
R23	100K			
R24	470Ω			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R25	390K			
R26	390K			
R27	47K			
R28	100K			
R29	100K			
R30	1meg			
R31	4.7meg			
R32	1meg			
R33	4.7meg			
R34	500Ω 5W	PW5-500	5W-SQ-500	
R35	10K 2W			
R36	100K			
R37	22K			
R38	22K			
R39	300Ω 5W	PW5-300	5W-SQ-300	
R40	22meg			
R41	22meg			
R42	1000Ω			
R43	1000Ω			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	V-M PART No.	REPLACEMENT DATA
K1	Preamp. Network	560mmf, .01mfd, 2200Ω, 100K, 150K, 220K, 1meg, 2.2meg, 10 meg	12564-6	
K2	Record Network	180mmf, 470mmf, .01mfd, 47K, 47K, 100K, 100K, 220K	12563-6	
K3	Bias Osc. Network	200mmf, .001mfd, .001mfd, .002mfd, 100K, 100K, 100K, 100K	12565-3	
K4	Preamp. Network	560mmf, .01mfd, 2200Ω, 100K, 150K, 220K, 1meg, 2.2meg, 10meg	12564-6	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA V-M PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	Bias Choke	24249					
L2	Bias Choke	24249					
L3	Bias Osc.	12675					

ELECT. PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA V-M PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
	PRI.	SEC. 1	SEC. 2						
T1	117V @ .8A	700VCT @ .060A DC	5V @ 2A	12676					
	SEC. 3	SEC. 4	SEC. 5						
	6.3VCT @ 3.4A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA V-M PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
	PRI.	SEC.						
T2	5500Ω	30Ω Tap @ 6-8Ω	12671					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA V-M PART No.	QUAM PART No.	NOTES
	SIZE	FIELD	V. C. IMP.			
SP1	6"x 9"	PM	6-8Ω	8958-1	69A3Z8	
SP2	3½"	PM	14-16Ω	8959-5	3A15T	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA V-M PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3A 250V P/T	8635		318003 (3A 250V 3AG)		GJV 3	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA V-M PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	1N34A	17001		1N34A	1N34A	Channel A Record Level Rectifier
M3	1N34A	17001		1N34A	1N34A	Channel B Record Level Rectifier

MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M4	Head	12548	1/2 Track Playback
M5	Head	12585 (or) 12595	1/4 Track Record-Playback
M6	Head	12630 (or) 12593 (or) 12586	1/4 Track Erase
M7	Switch	8220	Monitor (3PDT Slide Type)

MISCELLANEOUS (cont)

ITEM No.	PART NAME	V-M PART No.	NOTES
M8	Switch	15865	Auto Shut-Off (Micro)
M9	Switch	12445	Track Selector (Rotary Wafer Type)
M10	Switch	15937	Equalization (Leaf Type)
M11	Switch	12444	Record-Play (Dual Slide Type)
M12	Motor	8015 (or) 16038 (or) 16154	Drive

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Pushbutton	8702-A22	Brown
Pushbutton	8702-A10	Red
Knob	15722-C	Outer, Brilliance, Level
Knob	15723-C	Inner, Tone, Volume
Knob	8140-A22	Speed Control
Knob	16188-A	Track Selector
Cabinet	16181	
Handle	24485	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder with CIRCUITRACE®

WESTINGHOUSE MODELS H-737P7, H-738P7 (Ch. V-2404-1)

WESTINGHOUSE MODELS
H-737P7, H-738P7 (Ch. V-2404-1)

MODEL H-737P7

WESTINGHOUSE MODELS
H-737P7, H-738P7 (Ch. V-2404-1)

TRADE NAME	Westinghouse Models H-737P7, H-738P7 (Ch. V-2404-1)		
MANUFACTURER	Westinghouse Electric Corp., Radio-Television Div., Metuchen, N. J.		
TYPE SET	Battery Operated Transistorized Portable AM Receiver		
POWER SUPPLY	6 Volts DC	RATING	12MA @ 6 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 — 1600KC		20MA @ 6 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3.....GENERAL CEMENT #9440
A4, A5.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6.....GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1625KC	"	"	A4	"
3.	"	1400KC	1400KC Signal.	"	A5	"
4.	"	600KC	600KC	"	A6	Adjust for maximum output. Repeat Steps 2, 3 and 4.

DISASSEMBLY

1. Remove 2 knobs.
2. Remove battery compartment cover.
3. Remove 2 screws from cabinet back.
4. Separate cabinet front (with chassis) from cabinet rear.
5. Slide out negative battery contact thru slot in cabinet.
6. Remove 4 chassis mounting screws. Remove cabinet from chassis.
7. Unsolder speaker leads.
8. If necessary, remove 4 printed board mounted screws from frame.
9. Push printed board toward volume control side, expand frame and when tuning gang gears unmesh, remove board, gang end first.

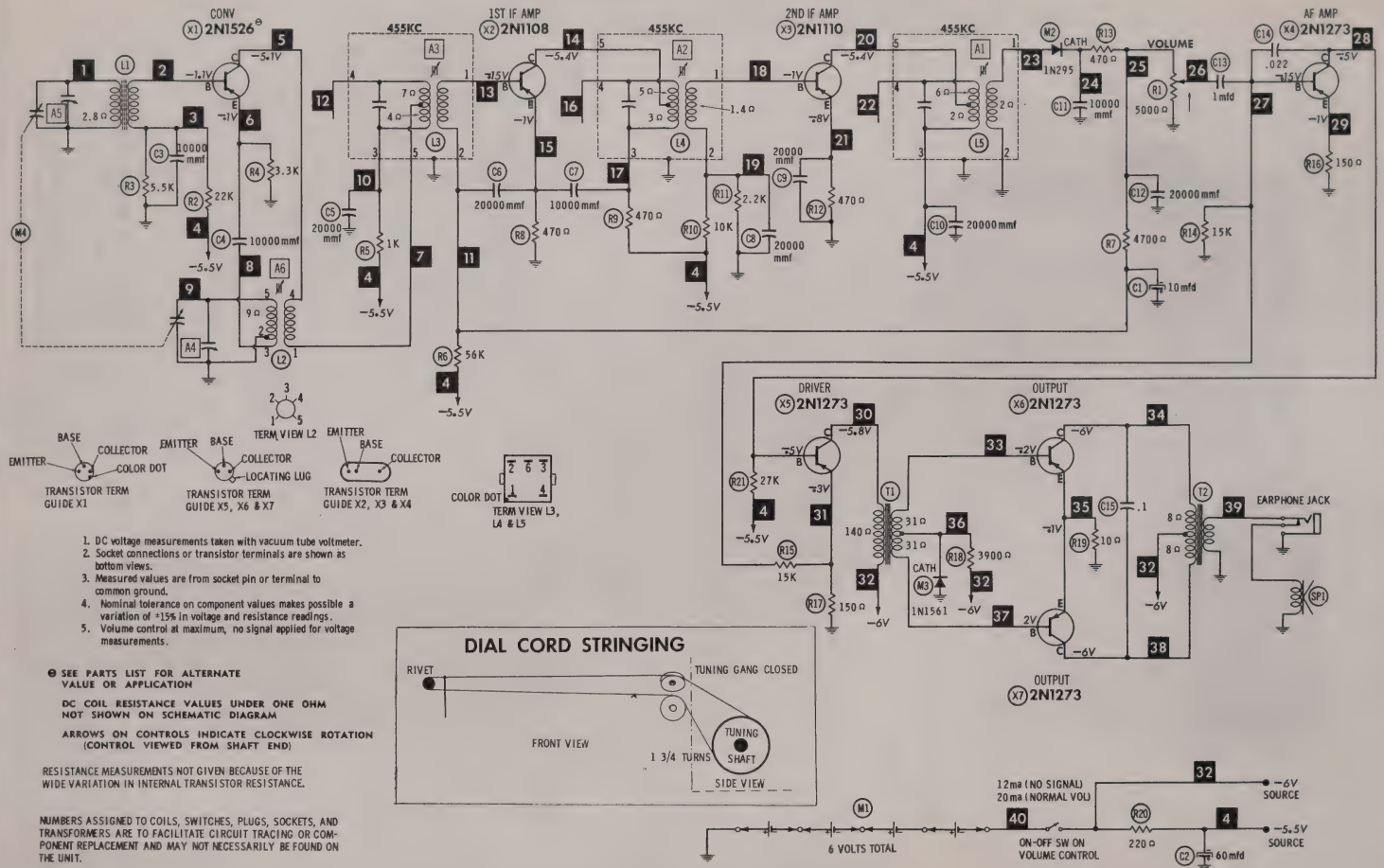
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

EIA MEMBER

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KF 600

SET 538 FOLDER 17



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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WESTINGHOUSE MODELS
H-737P7, H-738P7 (Ch. V-2404-1)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1526	Converter				PNP
	2N374 *	Converter				PNP
	2N1426 *	Converter				PNP
X2	2N1108	1st IF Amplifier		2N486	2N412	PNP
X3	2N1110	2nd IF Amplifier		2N483	2N409	PNP
X4	2N1273	AF Amplifier		2N408	2N362	PNP
X5	2N1273	Driver		2N408	2N362	PNP
X6	2N1273	Output		2N408	2N360	PNP } Matched
X7	2N1273	Output		2N408	2N360	PNP } Pair

* Alternate Type

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	10	218V012H11	PTT-10010	NLW10-15	TT12X10	MLV10-10	TE-1114	
C2	60	7	218V012H25	PTT-10050	NLW75-10	TT10X60	MLV50-10	TE-1134	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C6	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C10	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C13	1mfd 3V			UK-105				HY-135
C14	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-322	GEM-4122	2TM-S22
C15	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A B	5000Ω Switch	½	270V050H04			•		Volume Power Off-On

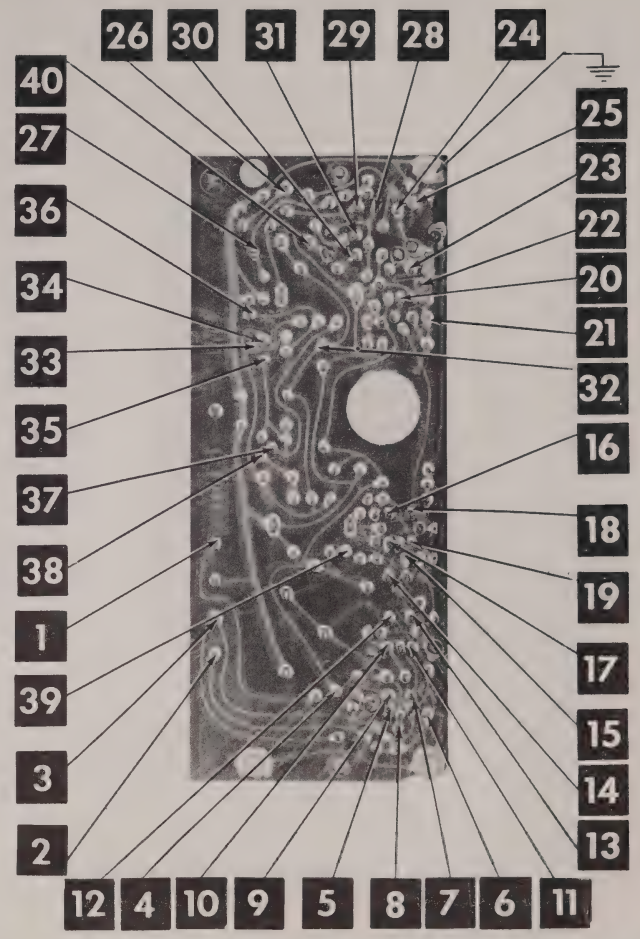
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	22K				R12	470Ω			
R3	5600Ω				R13	470Ω			
R4	3300Ω				R14	15K			
R5	1000Ω				R15	15K			
R6	56K				R16	150Ω			
R7	4700Ω				R17	150Ω			
R8	470Ω				R18	3900Ω			
R9	470Ω				R19	10Ω			
R10	10K				R20	220Ω			
R11	2200Ω				R21	27K			

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Westinghouse PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick	310V060H01				TA592	
L2	Osc.	230V091H01				TA856	
L3	1st IF	235V067H01				TB648	
L4	2nd IF	235V067H02				TB647	
L5	3rd IF	235V067H03				TB650	

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Westinghouse PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.6	1	430V097H01					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Westinghouse PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	350Ω CT	3-4Ω	430V098H01					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	570V085H01	4A05	

BATTERIES

ITEM No.	VOLTAGE	Westinghouse PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			130		635		M-14R	4 Required

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Westinghouse PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N295	296V002H01		1N295	1N295	Detector (Pigtail)
M3	1N1561	296V009H01				Output Bias

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M4	Tuning Cap.	330V037H01	2 Gang

CABINETS & CABINET PARTS

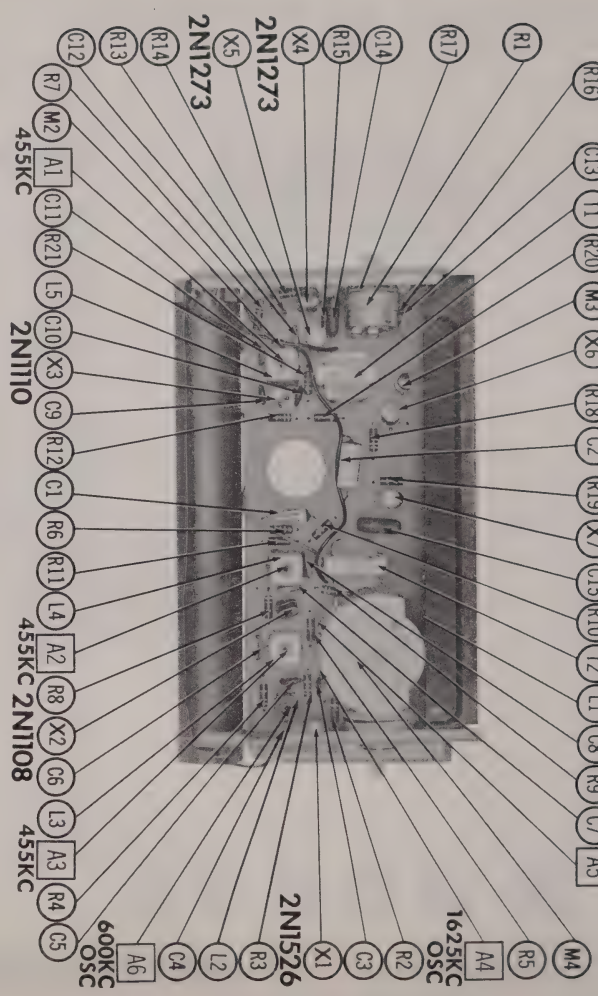
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Crystal	558V322H01	
Dial Pointer	558V329H01	
Knob	550V154H02	Tuning, Volume
Cabinet Back	513V070H01	Model H-737P7
Cabinet Back	513V070H02	Model H-738P7
Cabinet Front	513V069H01	
Handle	558V323H01	Model H-737P7
Handle	558V323H02	Model H-738P7

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



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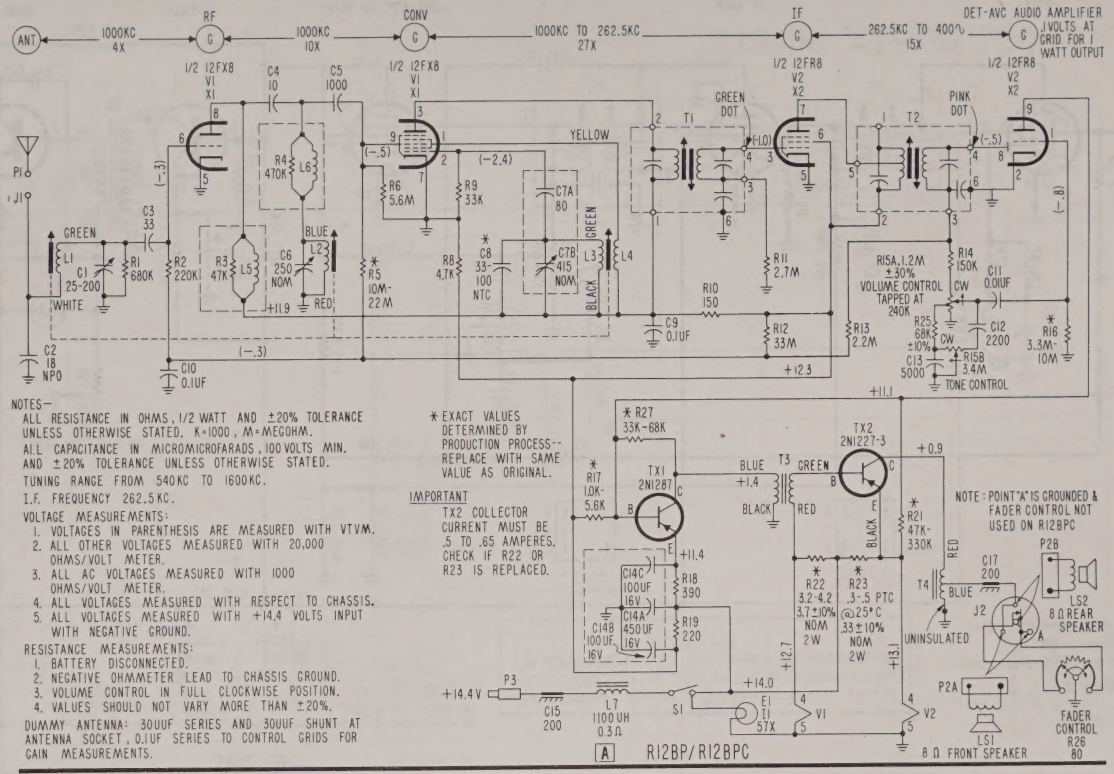
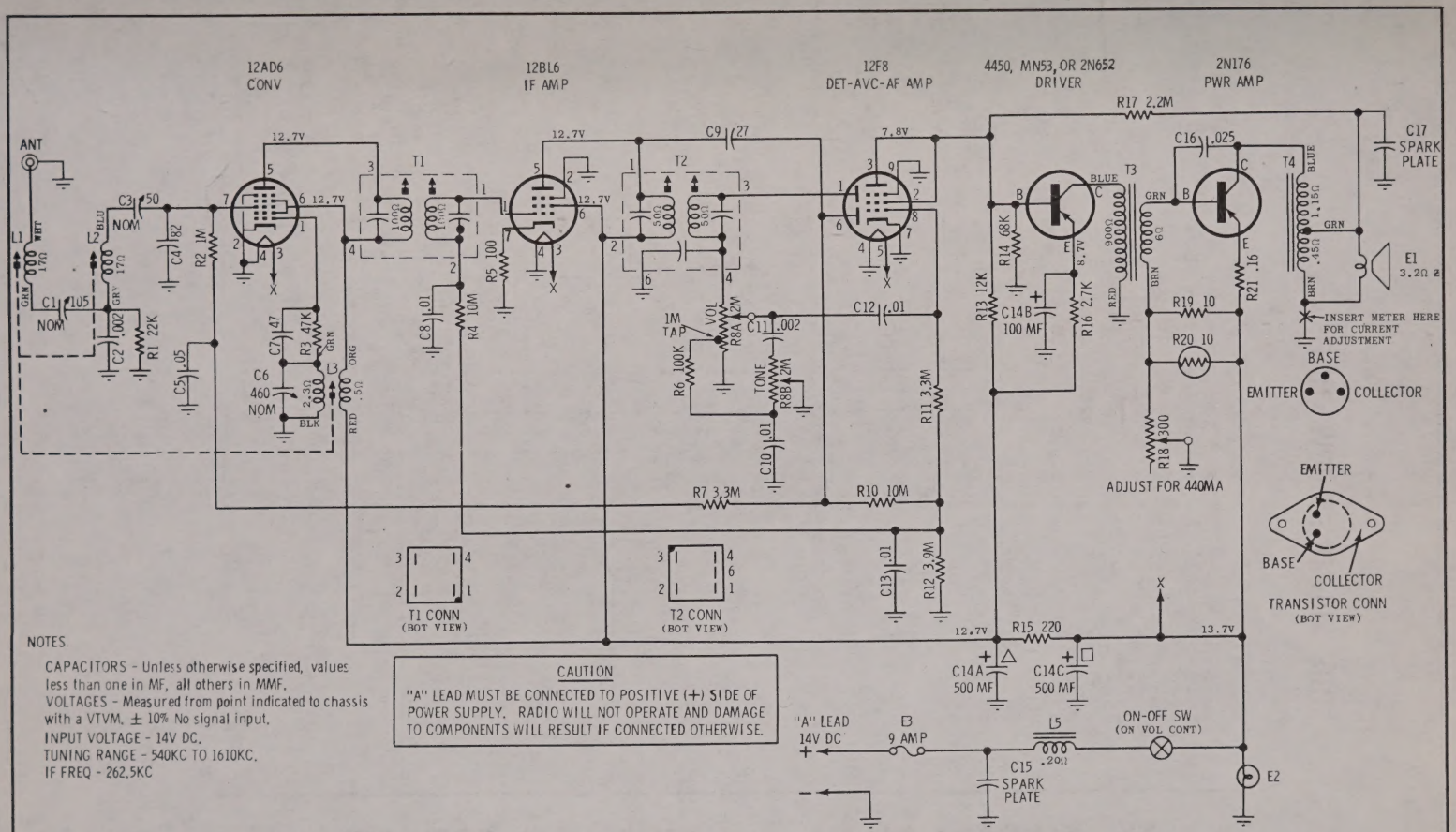


NOTE: Early production sets had a .005MF capacitor C16 connected across the primary of T3; resistor R27 was not used; a 6.8K ohm resistor R20 was connected from TX1-C to V2 pin 2; and V2 pin 2 was returned to ground through a 150 ohm resistor R24.

Schematic Diagram Courtesy of Bendix Radio, Division of Bendix Aviation Corp.



NOTES

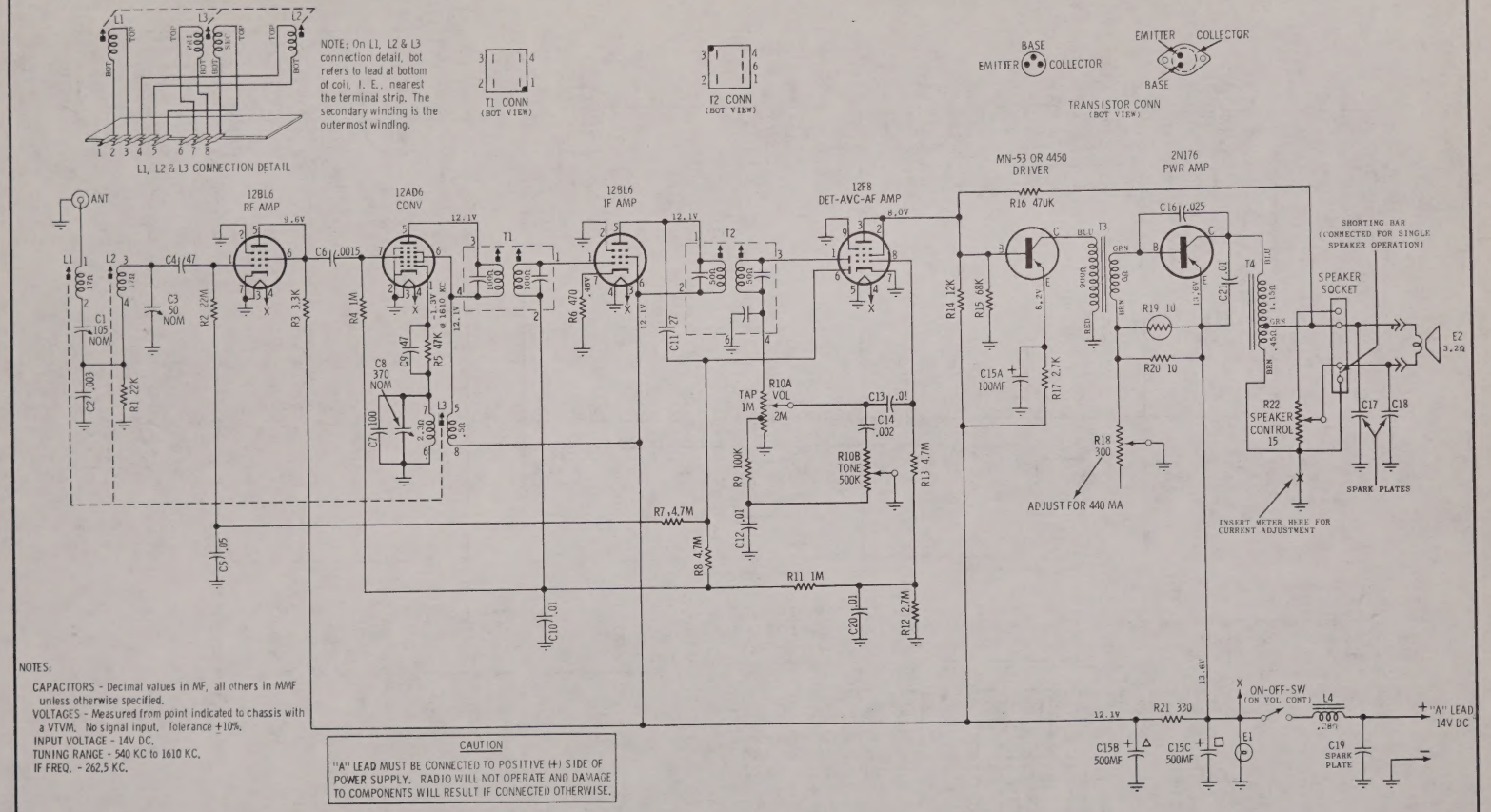
CAPACITORS - Unless otherwise specified, values less than one in MF, all others in MMF.
VOLTAGES - Measured from point indicated to chassis with a VTVM, ± 10% No signal input.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540KC TO 1610KC.
IF FREQ - 262.5KC

CAUTION

"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

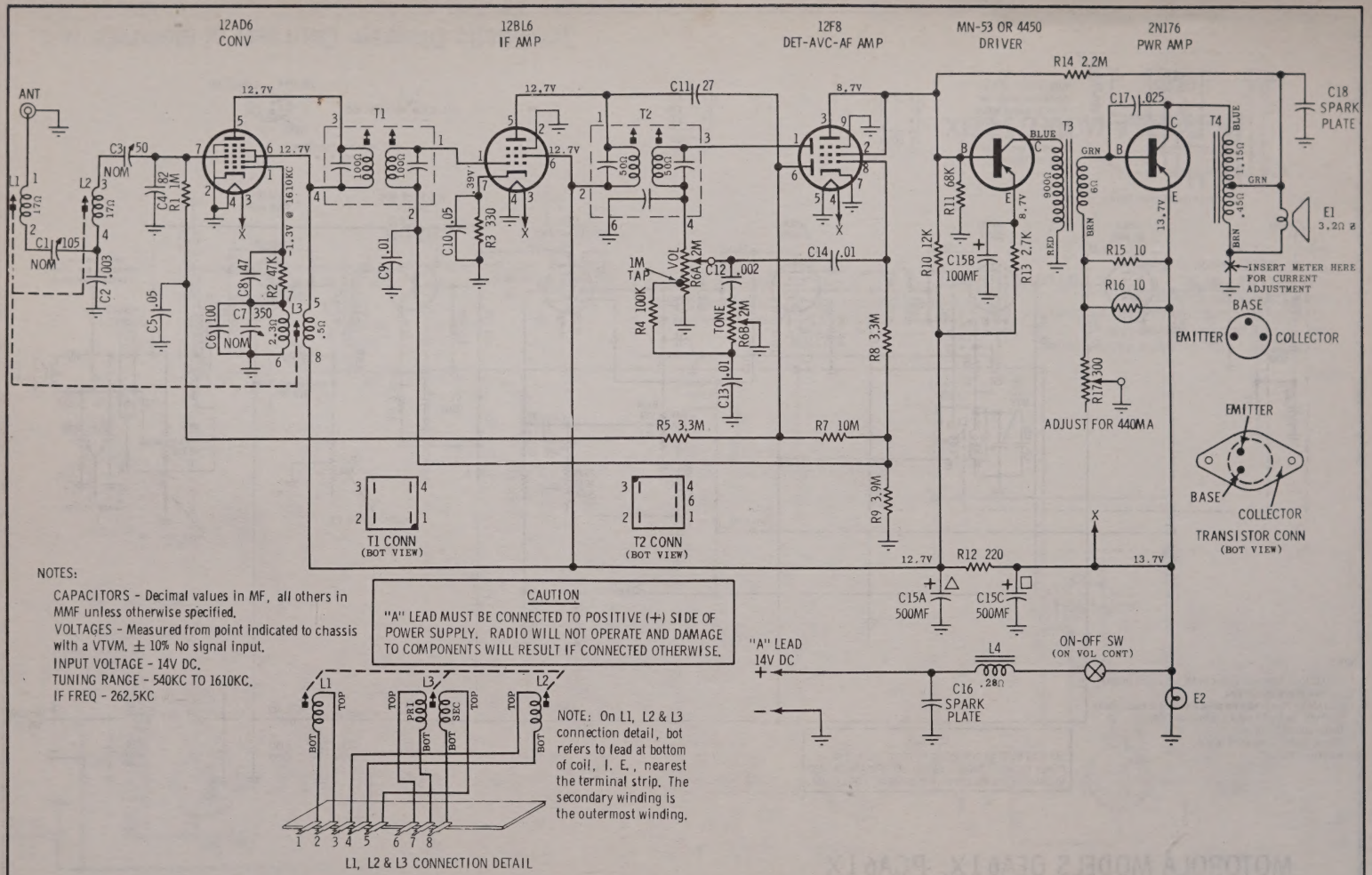
MOTOROLA MODEL 11MX

Schematic Diagram Courtesy of Motorola Inc.


L1 CONNECTION DETAIL
NOTE: On L1, L2 & L3 connection detail, bot refers to lead at bottom of coil, i. e., nearest the terminal strip. The secondary winding is the outermost winding.
T1 CONN (BOT VIEW)
T2 CONN (BOT VIEW)
TRANSISTOR CONN (BOT VIEW)
BASE
EMITTER
COLLECTOR
ANT
12BL6 RF AMP
12AD6 CONV
12BL6 IF AMP
12F8 DET-AVC-AF AMP
MN-53 OR 4450 DRIVER
2N176 PWR AMP
SHORTING BAR (CONNECTED FOR SINGLE SPEAKER OPERATION)
SPEAKER SOCKET
ADJUST FOR 440 MA
INSERT METER HERE FOR CURRENT ADJUSTMENT
SPARK PLATES
ON-OFF-SW (ON VOL CONT)
"A" LEAD 14V DC
NOTES:
CAPACITORS - Decimal values in MF, all others in MMF unless otherwise specified.
VOLTAGES - Measured from point indicated to chassis with a VTVM. No signal input. Tolerance ±10%.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540 KC to 1610 KC.
IF FREQ. - 262.5 KC.
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

MOTOROLA MODELS OEA61X, PCA61X

Schematic Diagram Courtesy of Motorola Inc.



NOTES:

CAPACITORS - Decimal values in MF, all others in MMF unless otherwise specified.
VOLTAGES - Measured from point indicated to chassis with a VTVM. ± 10% No signal input.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540KC TO 1610KC.
IF FREQ - 262.5KC

CAUTION

"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

L1, L2 & L3 CONNECTION DETAIL

NOTE: On L1, L2 & L3 connection detail, bot refers to lead at bottom of coil, I. E., nearest the terminal strip. The secondary winding is the outermost winding.

MOTOROLA MODEL CA61X

Schematic Diagram Courtesy of Motorola Inc.